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14. ABSTRACT - The expansion of the Internet and World Wide Web has enabled the global distribution of information on an unprecedented scale. This relatively recent occurrence has combined with rapid improvements in the functionality of "Commercial Off the Shelf" (COTS) Information and Communications Technology (ICT) to create unprecedented opportunities for the design and implementation of innovative Advanced Distributed Learning (ADL) and Knowledge Management (KM) systems on a global scale. The Center for International Rehabilitation (CIR), through its International Rehabilitation Network (IRN) program, has been in the forefront of such efforts in remote, underserved and post-conflict areas of the world. The current proposal represents a continuation and expansion of these efforts. It calls for the systematic evaluation of IRN's blended distributed learning efforts to date, the creation of scalable models of content development and delivery, and the engineering of an updated web portal facilitating Virtual Communities of Practice (CoP). The aims of the project are: to develop a web-based Knowledge Management system coupled with a global alliance of participating individuals and institutions to allow for the development and evaluation of a variety of educational and training strategies including but not limited to Advanced Distributed Learning (ADL), Communities of Practice (CoP) and Open Content Development. Knowledge Management is important to any organization. The research and development of cost effective strategies to harness knowledge communities, and to create and deliver Advanced Distributed Learning (ADL), is particularly important to large technologically advanced, culturally and geographically diverse organization such as the Department of Defense. In addition, a sub-component of the project focuses on training for three cohorts of individuals; physicians, physical therapists and hospital administrators working at Ministry of Health rehabilitation centers in Iraq. The proposed project will test the hypothesis that it is possible to design and implement a global Knowledge Management system facilitating Advanced Distributed learning to serve geographically and culturally diverse audiences in remote and underserved regions of the world in a cost-effective manner using commercially-available "off the shelf" technology.

15. SUBJECT TERMS
Distance learning, Amputee, Rehabilitation Professionals, Database, Telemedicine, Knowledge Management, Communities of Practice

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14. ABSTRACT

The expansion of the Internet and World Wide Web has enabled the global distribution of information on an unprecedented scale. This relatively recent occurrence has combined with rapid improvements in the functionality of "Commercial Off the Shelf" (COTS) Information and Communications Technology (ICT) to create unprecedented opportunities for the design and implementation of innovative Advanced Distributed Learning (ADL) and Knowledge Management (KM) systems on a global scale. The Center for International Rehabilitation (CIR), through its International Rehabilitation Network (IRN) program, has been in the forefront of such efforts in remote, underserved and post-conflict areas of the world. The current proposal represents a continuation and expansion of these efforts. It calls for the systematic evaluation of IRN's blended distributed learning efforts to date, the creation of scalable models of content development and delivery, and the engineering of an updated web portal facilitating Virtual Communities of Practice (CoP).

The aims of the project are: to develop a web-based Knowledge Management system coupled with a global alliance of participating individuals and institutions to allow for the development and evaluation of a variety of educational and training strategies including but not limited to Advanced Distributed Learning (ADL), Communities of Practice (CoP) and Open Content Development. Knowledge Management is important to any organization. The research and development of cost effective strategies to harness knowledge communities, and to create and deliver Advanced Distributed Learning (ADL), is particularly important to large technologically advanced, culturally and geographically diverse organization such as the Department of Defense. In addition, a sub-component of the project focuses on training for three cohorts of individuals; physicians, physical therapists and hospital administrators working at Ministry of Health rehabilitation centers in Iraq. The proposed project will test the hypothesis that *it is possible to design and implement a global Knowledge Management system facilitating Advanced Distributed learning to serve geographically and culturally diverse audiences in remote and underserved regions of the world in a cost-effective manner using commercially-available "off the shelf" technology.*

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Glossary

ADL: Advanced Distributed Learning
AMA: American Medical Association
BiH: Bosnia and Herzegovina
CIR: Center for International Rehabilitation
CMS: Chicago Medical Society
CoPs: Communities of Practice
CRPD: Convention on the Rights of People with Disabilities
FELP-AA: A non-governmental organization based in Nairobi, Kenya committed to developing and maintaining a network of Public Health epidemiologists and laboratory scientists who have graduated from the Field Epidemiology Training Program (FELTP)
GUI: Graphical User Interface
GIS: Global Implementation Solutions - a non-profit organization which assists local and international healthcare partners and clients with coordinating, implementing and monitoring their healthcare activities.
iCons in Medicine: program incorporating a number of tools to allow healthcare providers to connect online
iConsult: teleconsultation program that connects healthcare providers in remote or medically underserved areas with a network of committed specialty physicians
IDEAnet: International Disability Educational Alliance
IDRM: International Disability Rights Monitor
IMSA: Iraqi Medical Sciences Association
ISPO: International Society for Prosthetics and Orthotics
iRC: iCon Resource Center
iTAB: iCons Tele-consultation Advisory Board
ITF: International Trust Fund for Demining and Mine Victims Assistance
KM: Knowledge Management
MOU: Memorandum of Understanding
NAAMA: National Arab American Medical Association
NGOs: non-governmental organizations
NUPOC: Northwestern University Prosthetic and Orthotic Center
OCs: online communities
OERs: Open Educational Resources
P&O: prosthetics and orthotics
PT: physical therapists/physiotherapists
SCORM: Shareable Content Object Reference Model
SN: social networking
UKC: University Klinical Center
VCoPs: Virtual Communities of Practice
WBCL: Web-Based Collaborative Learning

Introduction

The contractor for the International Disability Educational Alliance (IDEAnet) is the Center for International Rehabilitation (CIR). William K. Smith, MD, is the Principal Investigator. The mission of IDEAnet is to foster collaborative efforts to use distributed learning and telemedicine to address health disparities and foster effective, sustainable health services internationally. This is accomplished through the innovative use of telecommunications technologies, computer-based training, state-of-the-art engineering projects, capacity-building education programs, interactive online tools, and advocacy on disability rights. In order to best achieve this mission, the network is divided into two topically-based Communities of Practice: the Rehabilitation Services Community and the Telemedicine Resource Center. Under the scope of work completed during this grant period, the CIR continues its work to develop a global pedagogical model as a framework for guiding the cost-effective development and delivery of blended Advanced Distributed Learning. The CIR has added to this the development of an effective, web-based Knowledge Management platform to facilitate Virtual Communities of Practice, including a medical volunteer network, as well as Open Content development, Information Services and effective program evaluation.

Body

A. Research (R) and Development (D) of Pedagogical Model, Virtual Community of Practice and Medical Volunteer Network (iCon).

R1: Research and evaluate the existing empirical literature and theoretical/conceptual models for social design strategies and relevant technologies for building effective Virtual Communities of Practice in a cross-cultural, disability-related, poly-linguistic setting.

As noted in the previous year's report, the terminology used to describe Virtual Communities of Practice (VCoP) and their structure is similar to that associated with Online Communities (OCs) and Social Networking (SN). Though the concepts are not identical, the overlapping themes and structural elements are markedly similar, as both VCoPs and OCs focus on the development of a strong network of individuals with whom information and knowledge can be shared. The term "Communities of Practice" (CoP) has been used historically to describe "groups of people informally bound together by shared expertise and passion for a joint enterprise."[1] Further, these groups are formed to "reflect the members' own understanding of what is important,"[2] and members of these communities were expected and encouraged to "share their experiences and knowledge in free-flowing, creative ways that foster new approaches to problems."[3] Examples of CoPs are found within a number of organizations, and have been called different names at various times, including "learning communities"

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[1] Wenger, Etienne C. and Snyder, William M. (2000). Communities of Practice: The Organizational Frontier. *Harvard Business Review*. January-February 2000: 139-145.

[2] Wenger as per Gongla, P. and Rizzuto, C.R. (2001). Evolving communities of practice: IBM Global Services experience. *IBM Systems Journal*. 40(4): 842-862.

[3] Gongla, P. and Rizzuto, C.R. (2001). Evolving communities of practice: IBM Global Services experience. *IBM Systems Journal*. 40(4): 842-862.

(Hewlett-Packard Company) and "knowledge networks" (IBM Global Services).[4] Regardless of the variation in nomenclature, CoPs (virtual or otherwise) and Online Communities share the goal of connecting a disparate group of individuals or practitioners and allowing them to take responsibility for a domain of knowledge.

Successful VCoPs and OCs, according to Yang, are those "in which the contribution of each member is highly regarded…[and in which] every member [is asked] to take responsibility for information-sharing and problem solving."[5] Successful OCs have been described as those which "do not just serve the user but also *involve* the user,"[6] and Gongla and Rizzuto note the importance of daily participation by members of a community to foster the "exchange of ideas with other individuals who have experience and skill related to the same area of work."[7] It is not sufficient simply link individuals to one another based solely on their occupation, but rather individuals must be encouraged for establish personal connections with one another.[8] While encouraging members' active participation in an online community can be difficult, and studies indicate that " 'lurking' is the 'norm' and only a few members post regularly"[9], steps can be taken to improve user participation. Creating a shared history among users, developing a means of welcoming new members to foster the development of a strong community, and ensuring that members see value in participation can help to increase their involvement.[10] [11] Through active networking tools and resources, including membership and program updates, it is possible to encourage members of an OC to contribute knowledge that may be of interest to other community members.

By using e-newsletters and external websites, particularly "social networking sites,"[12] it is possible to raise awareness about the existence of an OC and encourage new membership to join. Additionally, these tools provide credibility and value to the materials and information contained within the community. Building on existing connections with key partners allows for the establishment of an OC that not only enables and facilitates collaboration between members, but also "trust management, accountability, and quality control" of the materials and information within the OC.[13] The verification of member credentials and identity is of great import, as Kamel Boulos and Wheeler note, to ensure the validity of the information that they provide to the community.[14] Though unrestricted membership would be ideal, by restricting

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[4] Ibid.

[5] Yang, Shih-Hsien (2009). Using Blogs to Enhance Critical Reflection and Community of Practice. *Educational Technology & Society*, 12(2): 11-21.

[6] Hannay, 2007 per McGee, James B. and Begg, Michael (2008). What medical educators need to know about "Web 2.0" *Medical Teacher*. 30: 164-169.

[7] Gongla and Rizzuto (2001).

[8] Ibid.

[9] Sutton, 2001; Preece, Nonnecke and Andrews, 2004 per Riverin, Suzanne and Stacey, Elizabeth (2008). Sustaining and Online Community of Practice: A Case Study. *Journal of Distance Education*, 22(2): 43-58.

[10] Gray (2004) per Riverin and Stacey (2008)

[11] Gongla and Rizzuto (2001) note the importance of shared experiences and common tacit knowledge.

[12] These include Facebook (rank 15, 40 million users), and sites such as Wordpress (blogging; rank 29, 26 million users), Twitter (microblogging), YouTube (video sharing; rank 6, 73 million users), others.
Ranking and user data per Fuchs, Christian (2010). Social Software and Web 2.0: Their Sociological Foundations and Implications. In *Handbook of Research on Web 2.0, 3.0, and X.0: Technologies, Business, and Social Applications.* Volume II, ed. San Murugesan, 769-789. Hershey, PA: IGI-Global. Pp. 764-789. Figures provided differ from other sources, including McGee and Begg (2008) and Breen (2008).

[13] Eysenbach MD MPH, Gunther (2008). Medicine 2.0: Social Networking, Collaboration, Participation, Apomediation, and Openness. *Journal of Medical Internet Research.* July-September; 10(3): e22.

[14] Kamel Boulous, Maged N. and Wheeler, Steve (2007). The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education. *Health Information and Libraries Journal*, 24: 2-23.

membership to individuals that are part of a particular group or profession, it is possible to limit or eliminate issues related to abuse or the distribution of inappropriate materials.[15]

The utilization of "Web 2.0 tools"[16] within an online networking website allows an opportunity for members of the OC to share and create information and connect to one another based on common interests or goals. Web 2.0 network technologies and services employ a "user-focused" approach with regard to their design and functionality, allowing for the creation of content by and collaboration between members.[17] Further, these technologies have led to the creation of new platforms that allow users to communicate, collaborate, and share information online.[18] The United Nations (UN) indicates that approximately 1.8 billion people worldwide are now using the Internet,[19] and according to recent reports by 2011, an estimated 80 percent of active Internet users will have a virtual presence,[20] including the use of SN websites, which Forrester Research increased by 60 percent in 2008 among individuals aged 35 to 54.[21] Additional reports indicate that websites focused on user-generated content including YouTube, Facebook, and Twitter continue to gain in popularity.[22]

In addition to "lay uses" of SN websites, individuals are using these and other sites to locate health information. According to findings of a recent study, 61 percent of Americans have searched online to find answers to health-related questions.[23] Further, a recent report from the London School of Economics indicated that there is more health information than ever available online, and it is becoming increasingly accessible as smartphones, and tablet and personal computers become more common.[24] David McDaid, senior research fellow at the London School of Economics, notes the importance of validating the sources of information posted online, particularly information that is available to the general public.[25] Without some type of verification of an individual's credentials, there is a "risk of dissemination of incorrect

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[15] McGee, James B. and Begg, Michael (2008). What medical educators need to know about "Web 2.0." *Medical Teacher*. 30: 164-169.

[16] As reported previously, Web 2.0 views the Internet as a result of the creation of its users, and tasks the user with creating, updating, and changing the content and trends of how the web, technology, and web design are used to enhance creativity, communications, secure information sharing, collaboration and functionality. Common "Web 2.0 tools" include blogs, vlogs, Wikis, RSS feeds, photo and video sharing, web forums, instant messaging, and chats.

[17] O'Reilly, 2005 per McGee, James B. and Begg, Michael (2008). What medical educators need to know about "Web 2.0." *Medical Teacher*, 30: 164-196.

[18] Ferdig, R.E.; Coutts, J.; DiPietro, J.; Lok, B.; and Davis, N. (2007). Innovative technologies for multicultural education needs. *Multicultural Education & Technology Journal.* 1(1): 47.

[19] UN News Centre. "Internet can help reach anti-poverty goals, UN official tells governance forum." *UN News Centre*. Updated: September 14, 2010. Accessed online: 11/8/2010 - http://www.un.org/apps/news/story.asp?NewsID=35918&Cr=internet&Cr1=development

[20] Bronack, S.; Cheney, A.; Tashner, J.; Sanders, R.; and Matzen, N. (2009). Presence Pedagogy: Building Communities of Practice in Virtual Worlds. *Appalachian State University, Reich College of Education.* Available online: http://www.slideshare.net/awcheney/cider

[21] Wortham, Jenna. "Baby Boomers, Luddites? Not So Fast." *The New York Times*. Updated: February 20, 2009. Accessed online 11/8/2010 - http://bits.blogs.nytimes.com/2009/02/20/baby-boomers-luddites-not-so-fast/

[22] Breen, Kerri. "Wake up, social media users, we're crushing our creation." *CBC News*. Updated: April 28, 2009. Accessed online 11/8/2010 - http://www.cbc.ca/canada/story/2009/04/27/f-vp-breen.html

[23] Pew Research Center. "61% of American adults look online for health information." *Pew Internet*. Updated: June 11, 2009. Accessed online: 11/8/10 - http://www.pewinternet.org/Press-Releases/2009/The-Social-Life-of-Health-Information.aspx

[24] *Reuters Online*. "Online health info popular but often unchecked." Updated: January 4, 2011. Accessed online 1/12/11. http://www.reuters.com/article/idUSTRE7031JL20110104

[25] *Reuters Online*. "Online health info popular but often unchecked." Updated: January 4, 2011. Accessed online 1/12/11. http://www.reuters.com/article/idUSTRE7031JL20110104

information," which in the case of health-related information can be particularly problematic.[26]

Physicians, healthcare providers, and health and medicine-related organizations are among those creating and accessing information posted online. Dr. Karthik Murugiah, author of a recent study on the use of YouTube to provide information on CPR techniques, noting the massive reach of SN websites, stated "professional groups could make more use of them to boost public awareness."[27] According to Dr. Joseph Kvedar, the Director of the Center for Connected Health, SN websites such as Twitter provide "a method of mass communication" that is real-time and "designed for mobility."[28] [29] Medical associations and organizations frequently use Twitter to share information with their membership or other interested parties quickly. Clinical nurse Phil Baumann has noted a number of additional medical uses for Twitter,[30] [31] which include:

1. Disaster alerting and response,
2. Drug safety alerts from the FDA,
3. Diagnostic brainstorming, and
4. Rare disease tracking and resource connection.

Healthcare providers who chose to use SN websites may opt to only connect to other physicians, or to also connect with patients. According to Pauline Chen, MD it is unclear if engagement via Facebook and Twitter helps or hinders a patient-doctor relationship[32] - a concern that is echoed by other physicians. Studies indicate that medical trainees are among those in the medical profession who are frequently using SN sites, and 44.5 percent of them have a Facebook account.[33] While the insight that these individuals may be able to contribute to a discussion on a particular topic may differ from that of more established clinicians, Thompson, et al.[34] note that their understanding of the importance of medical professionalism and patient privacy may be a concern when using social networking websites.

Per Kamel Boulos and Wheeler, the inclusion of Web 2.0 tools on a website can help to create "a more human approach to interactivity on the Web…[and a] greater sense of community in a potentially 'cold' social environment."[35] Further, these tools can provide an environment "where advice and expertise, and even multi-media clinical

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[26] Norton, Amy. "Be wary of CPR lessons on YouTube: study." *Reuters Online.* Updated: January 5, 2011. Accessed online 1/12/11. http://www.reuters.com/article/idUSTRE70449120110105

[27] Norton, Amy. *Reuters,* January 5, 2011.

[28] Cimpanu, Catalin. "Twitter Embraced by the Medical Community." *Softpedia*. Updated: August 25, 2009. Accessed online 11/8/2010 - http://news.softpedia.com/news/Twitter-Embraced-by-the-US-Medical-Community-120041.shtml

[29] Scott, Katie. "How Twitter helps doctors do their jobs." *Wired UK*. Updated: August 26, 2009. Accessed online 11/8/2010 - http://www.wired.co.uk/news/archive/2009-08/26/how-twitter-helps-doctors-do-their-jobs-.aspx

[30] *USAToday, Science Fair.* "Doctors: A Tweet a day keeps the patients informed." Updated: August 24, 2009. Accessed online 11/8/2010 - http://content.usatoday.com/communities/sciencefair/post/2009/08/68497630/1

[31] Baumann, Phil. "140 Health care Uses for Twitter." Updated: January 16, 2009. Accessed online 11/8/2010 - http://philbaumann.com/2009/01/16/140-health-care-uses-for-twitter/

[32] Chen, Pauline W. "Medicine in the Age of Twitter." *The New York Times*. Updated: June 11, 2009. Accessed online 11/8/2010 - http://www.nytimes.com/2009/06/11/health/11chen.html

[33] Thompson MD MS, Lindsay, A.; Dawson PhD, Kara; Ferdig PhD, Richard; Black MA, Erik W.; Boyer Med, J.; Coutts Med, Jade; and Black MD, Nicole Paradise (2008). The Intersection of Online Social Networking with Medical Professionalism. *Journal of General Internal Medicine*. July; 23(7): 954-957.

[34] Ibid.

[35] Kamel Boulous, Maged N. and Wheeler, Steve (2007).

elements, can be easily shared among [physicians]…and where they can all learn from each other."[36] The opportunities to collaborate with others in the same field provided by OCs are particularly valuable for clinicians who are "isolated from typical urban clinical centres [sic] of excellence, in remote and rural areas."[37]

By utilizing SN websites that have an existing audience, the CIR has been better able to increase awareness about IDEAnet programs and encourage user involvement. YouTube channels have been created for the iCons in Medicine and International Disability Rights Monitor (IDRM) programs,[38] and videos related to program activities have been posted. Additional materials pertaining to the iCons and IDRM programs have been posted within Groups and Fan Pages created on Facebook, as well as on Twitter.[39] Bi-weekly blog posts[40] and e-newsletters[41] sent to iCons in Medicine members cover a range of global health and health IT topics, and have helped to increase user involvement in the program. The use of these external sites have also helped to encourage new traffic to the IDEAnet website, and have increased interest in its programs.

R2: Research into issues of importance in the areas of Knowledge Management and Communities of Practice.

A review of the current literature suggests a shift in the field of Knowledge Management (KM) towards a model that places greater emphasis on the generation of content by users. SNs and OCs provide an opportunity to encourage users to engage in "cross organizational sharing"[42] within the KM field, making it possible to "bring disparate groups together to foster sharing, thus efficiently using knowledge."[43] When opportunities for interaction, sharing, and collective learning, are made available to participants in an OC focused on KM, they will likely contribute to the knowledge base. As illustrated in Table 1, websites that allow users to contribute information, either through text, images, videos, or multiple forms of media continue to gain in popularity. Per Liaw, et al., these SN websites allow individuals to "acquire and share experience or knowledge."[44] By offering information of value to users through channels with which they area already familiar, it is possible to encourage their participation in other OCs.

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[36] Ibid.
[37] Ibid.
[38] http://www.youtube.com/user/IconsinMedicine and http://www.youtube.com/user/TheIDRM respectively
[39] http://twitter.com/iCons_in_Med and http://twitter.com/The_IDRM
[40] Information on a range of topics is posted on a blog on Wordpress (http://iconsinmedicine.wordpress.com), Blogger (http://iconsinmedicine.blogspot.com/), and Tumblr (http://iconsinmedicine.tumblr.com/). Similar accounts have been created for the IDRM (see the "Socialize" tab of http://card.ly/The_IDRM for more information).
[41] Archive of past "iConnection" e-newsletters is available online:
http://archive.constantcontact.com/fs033/1102482325007/archive/1102518353612.html
[42] Wilensky, H.; Su, N. Makoto; Redmiles, D.; and Mark, G. (2008). *A Community of Knowledge Management Practioners: Mirroring Power across Social Worlds*, in IFIP International Federation for Information Processing, Volume 270; *Knowledge Management in Action*, Mark Ackerman, Rose Dieng-Kuntz, Carla Simone, Volker Wulf; (Boston: Springer), pp. 195-207.
[43] Ibid.
[44] Liaw, Shu-Sheng; Chen, Gwo-Dong; Huang, Hsiu-Mei (2008). Users' attitudes toward Web-based collaborative learning systems for knowledge management. *Computers and Education*, 50: 950-961.

Website	URL	Ranking[45]	Instructional Information[46]	Materials for Download[47]	Social Networking	Video Sharing	Photo Sharing	Blogging	Micro Blogging
Blogger	www.blogger.com	8							
Facebook	www.facebook.com	2							
Flickr	www.flickr.com	36							
Instructables	www.instructables.com	1,356							
Tumblr	www.tumblr.com	100							
Twitter	www.twitter.com	10							
VodPod	www.vodpod.com	2,000							
WordPress	www.wordpress.com	19							
YouTube	www.youtube.com	3							

Table 1: Information regarding the external social networking websites selected to disseminate information about IDEAnet programs. Shades of gray are used to show the availability of each dissemination method allowed on the site – darker gray tones denote websites that are more applicable for this type of activity, the darkest being those for which the website is most applicable.

The establishment of a KM network within an online community allows participants to not only "absorb information, but also to connect their previous knowledge to their newly acquired information."[48] Gongla and Rizzuto note the importance of participants in a KM network being aware of the scope and membership of the community, as well as the roles of those involved.[49] By ensuring that members of a KM-based OC are aware of their place within the community, the likelihood that they will share information that is of interest to them with the broader group increases, allowing all participants in the community to benefit from the information.[50] As noted by He et al., individuals within a network who view one another as " 'real' and trustworthy" are more likely to exchange information.[51] By involving social networking opportunities in a KM network, which may include the use of personal and organizational profiles, participants in the network are able to familiarize themselves with one another and are more likely to contribute new knowledge and information.

According to Lau, et al., the most successful KM-based OCs are those in which users are able to not only interact with one another directly, but also "distribute, disseminate,

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[45] "Ranking" is as per Alexa (http://www.alexa.com/). Sites are ranked according to: users worldwide, page views, minutes per visit, and other factors.

[46] "Instructional Information" is used here to denote the provision of information related to how to participate in IDEAnet programs, and background information.

[47] "Materials for Download" is used here to denote materials that will be provided for download and use by interested parties. The materials may include: written/pictorial instructions, articles, videos, images, and other materials.

[48] Liaw, et al. (2008)

[49] Gongla and Rizzuto (2001).

[50] King, William R. and Marks Jr., Peter V. (2008). Motivating knowledge sharing through a knowledge management system. *Omega*, 36: 131-146.

[51] He, Wei; Qiao, Qian; and Wei, Kwok-Kee (2009). Social relationship and its role in knowledge management systems usage. *Information & Management*, 46: 175-180.

exchange and share information in different multimedia formats such as voice, movie, and peer-to-peer, or to a group."[52] This type of extensive sharing can be achieved through the use of Web 2.0 tools, both within the OC and by posting materials on external websites. In addition to allowing users to share video, photos, and other media, the creation of a discussion space is imperative to the formation of strong relationships within a KM network.

As noted by experts on the structure of social networks and social interaction, the formation of an online KM network is dependent on weak and strong ties, and a system that includes both is most successful.[53] Strong ties are characterized by common norms and high social network density, while weak ties are those that form in the "holes" between these norms within the social network. The strength of ties in a network is determined by the amount of time, emotional connection, level of intimacy, and amount of reciprocation among users and within user-groups in a given network.[54] Individuals with strong social ties to one another are likely to have overlapping bases of knowledge and experience, and thus the information that they can provide to a network may be less diverse.[55] While networks with only strong ties are frequently viewed by researchers as being "redundant," a recent study by Damon Centola, assistant professor of system dynamics and economic sociology at the MIT Sloan School of Management, indicates that "people need to hear a new idea multiple times before making a change" and so the repetition produced by strong ties may be beneficial.[56]

While strong ties are likely to promote the transfer of tacit knowledge, weak ties are also of great import to the development of a successful KM network, and it is through them that new knowledge can best be introduced into a KM-based OC. Weak ties represent a perspective that is not within the shared norms of most participants in the network. Thomas, et al. note the importance of "communication among loosely structured networks and communities of people."[57] As noted by Bouty,[58] the initial interaction between individuals with weak social ties may be approached with caution, however once the interaction proves to be mutually beneficial, it is likely to be repeated. While strong ties can create a "base of understanding" among participants, without some divergence and difference of opinion, new ideas are less likely to be generated, shared, or implemented within the network. Variation among participants in an OC, whether due to life experiences; geography; cultural, linguistic, political, religious variation; or other factors can contribute to the growth of a KM network. By communicating with one another about a given topic and understanding the basis of the

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[52] Lau, Adela and Tsui, Eric (2009). Knowledge management perspective on e-learning effectiveness. *Knowledge-Based Systems*, 22: 324-325.

[53] Granovetter, Mark (1983). The Strength of Weak Ties: A Network Theory Revisited. *Sociological Theory*, 1: 201-233.

[54] Granovetter (1983) as per Harmaakorpi, Vesa and Mutanen, Arto (2008). Knowledge Production in Networked Practice-based Innovation Processes – Interrogative Model as a Methodological Approach. *Interdisciplinary Journal of Information, Knowledge, and Management*, 3: 88-101.

[55] McFadyen, M. Ann; Semadeni, Matthew; and Cannella Jr., Albert A. (2009). Value of Strong Ties to Disconnected Others: Examining Knowledge Creation in Biomedicine. *Organization Science*. 20(3), May-June; 552-564.

[56] Dizikes, Peter. "Better health through social networking." *MIT News*. Updated September 3, 2010. Accessed Online 11/9/10 - http://web.mit.edu/newsoffice/2010/social-networks-health-0903.html

[57] Thomas, J.C.; Kellogg, W.A.; Erickson, T. "The knowledge management puzzle: Human and social factors in knowledge management." *IBM Systems Journal*. 40(4): 863-884.

[58] Bouty (2000), as per McFadyen et al.

differences between members of an OC and how these differences impact one's opinions, an open and effective exchange of knowledge can occur.[59]

R3: Pilot study of International Consultants in Medicine (iCon) in various geographically regions.

During the current reporting period, the CIR has investigated the possibility of supporting a data collection and epidemiology research study pilot project in Kenya with the Field Epidemiology and Laboratory Program Alumni Association (FELP-AA) - a non-government organization (NGO) based in Nairobi, Kenya which is committed to developing and maintaining a network of Public Health epidemiologists and laboratory scientists who have graduated from the Field Epidemiology Training Program (FELTP). Organizations in Kenya are currently collecting data using a paper-based process to support epidemiology studies, but are interested in exploring electronic means of capturing and managing this data. Through the iConsult program and participation from MedRed, a medical informatics company which has offered the use of its mobile application to iCons, for this purpose,, the CIR would be able to provide a store-and-forward application to record data, and transmit and store this data on systems which can be used for follow-up analytics. The application will enable the construction of customizable electronic forms for the data to be recorded for the various epidemiological studies, as well as providing a decision support component to enable the clinicians recording data to obtain a second opinion on the diagnosis of symptoms and the prescription of treatment.

The objectives of this mobile health program are:

1. To provide increased access to healthcare for people in developing countries, particularly for those living in remote locations.
2. To provide access to high-quality diagnosis and improve treatment outcomes.
3. To provide a means to monitor disease and epidemic outbreaks.
4. To provide cell phones, PDAs, computers, servers, and installation services that allow wireless transmission of clinical data and integration of the data into a database.
5. To provide instructional materials and train in-country clinical personnel to facilitate clinical data entry into the computers and databases.
6. Work with in-country personnel to plan and conduct a pilot assessment of the technologies defined by 1-5 above in developing countries.
7. Work with in-country personnel to evaluate clinical data and information technologies used in 6 above.
8. Evaluate potential dissemination of the technologies defined by 1-5 above to other parts of Kenya.
9. Provide management for the above tasks to include technical interfaces with medical experts to define and characterize system interfaces, assess and manage contract risks, and define a cohesive, integrated development and pilot evaluation effort for the project.

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[59] The importance of "openness to new ideas and perspectives" within a KM network is noted in Orzano, John A.; McInerney, Claire R.; Scharf, Davida; Tallia, Alfred F.; and Crabtree, Benjamin F. (2008). A Knowledge Management Model: Implications for Enhancing Quality in Health Care. *Journal of the American Society for Information Science and Technology*, 59(3): 489-505.

The proposed outline of the pilot is as follows:

Phase 1 (0 - 6 months)

Deployment (0 - 3 months)

Phase 1 will commence with the online demonstration of the tablet application. Assuming the application is felt to have merit and the parties agree to proceed, CIR will work with the partners to develop a plan for deployment, configuration, training and support for the Kenya pilot. The goal is to have a system up and running in 3 months. This will require the parties to reach an understanding on where the system will be hosted, who will have administrative responsibility and data access as well as other issues.

(Pilot 3-6 months)

For the pilot, CIR will provide 5 tablet computers with software for use in data collection activities in Kenya. These tablets may be used with cellular cards for real-time connectivity or in "store-and-forward" mode, which will allow information to be collected on the tablet in the field, encrypted and stored on the device and then forwarded to the server when the device is connected to the internet at a later time.

During phase one CIR will also work with Global Implementation Solutions (GIS) to better understand the program parameters, user needs, and technical infrastructure relevant to the project and will translate these into a set of long-term system configuration, installation, and support plan.

Phase 2 (6-12 months)

CIR will port the tablet computer application to a smartphone and/or tablet that may be deployed alongside the tablet computers in Kenya. The goal of this phase is to offer and smaller and more portable platform, for data collection, while at the same time leveraging smartphone technology and the cellular infrastructure. Should the smartphone-based application be well received, the parties may decide to proceed with rolling out a larger number of devices and porting the application to additional mobile platforms.

Phase 3 (12 months-ongoing)

CIR will provide long-term application support and maintenance, including enhancements and new features.

An online demo of capabilities which would be suitable for the data collection pilot in Kenya was presented to GIS, a U.S.-based liaison to FELP-AA, in February 2011. In mid-March 2011 a demonstration of this capability will be demonstrated to the parties in Kenya and it is expected that by the middle of the second quarter 2011 a decision will be made regarding the direction of the pilot project. It is expected that this pilot

will be successful and will lead to a long-term project for data collection in Kenya and other parts of the world where similar studies are underway.

Individuals in many regions of the world were affected by severe health crises following natural disasters during the reporting period. Haitians continue to be affected by epidemiological outbreaks following the 2010 earthquake and its aftermath. Citizens located near the earthquake epicenter and surrounding areas are in need of emergency epidemiological outbreak response systems and assistance. Similarly, individuals affected by massive floods in Pakistan were faced with insufficient supplies of food, potable water, medications, and healthcare personnel. In an effort to provide some assistance to these individuals, iConsult Chapters were created to allow physicians to designate their desire to provide consultations to medical personnel working in-country.

D1: Design and implement metrics for tracking involvement in Communities of Practice and the interactive components of Advanced Distributed Learning courses.

Previously, established basic quantitative metrics were used to assess the usage of the IDEAnet website, and measure the activity in interactive areas. These were applied during the current reporting period. The following tool was used to track these metrics:

- Google Analytics, a free service from Google that was implemented to track statistics for all CIR websites (http://www.google.com/analytics/index.html).\

Report Date Range: 2/1/2010 – 2/28/2011

## New Members
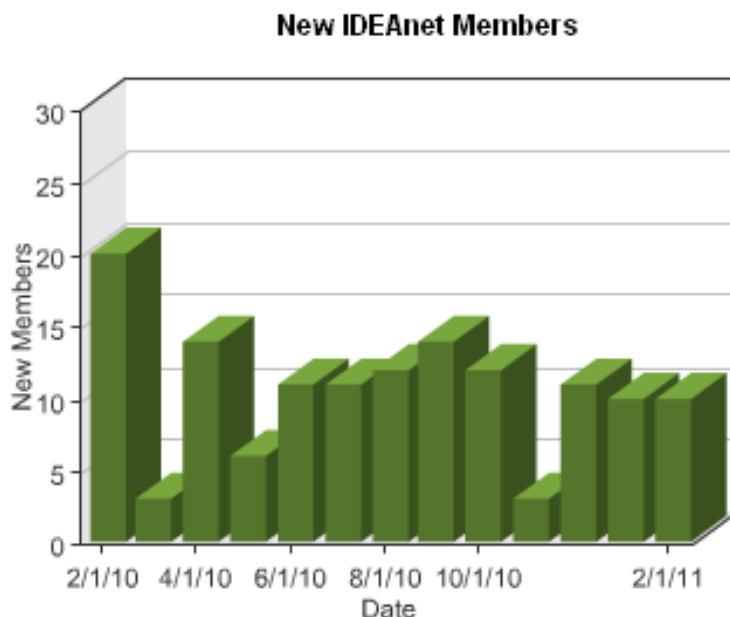
Graph 1 (Above): New members by date

As in previous years, custom metrics were used to measure certain functions and areas of the IDEAnet website. These tools were written to analyze the sites (Microsoft SQL database using ColdFusion) and to display the results in a password-protected website. Graph 1 above and the tables and graphs below display a monthly breakdown of the activity on ideanet.org February 2010 through February 2011.

Date Range	Visits	Page Views
Feb-10	1,999	4,654
Mar-10	2,240	5,366
Apr-10	2,021	4,446
May-10	1,916	4,011
Jun-10	1,733	3,751
Jul-10	1,752	3,604
Aug-10	1,650	3,325
Sep-10	1,706	3,914
Oct-10	2,150	4,477
Nov-10	1,746	3,549
Dec-10	1,307	3,250
Jan-11	1,292	3,103
Feb-11	1,604	3,406
Totals	**23,116**	**50,856**

Table 2 (Above): Visitor statistics- February 1, 2010 – February 28, 2011

Visits for all visitors
Feb 1, 2010 - Feb 28, 2011

Visits

3,000				3,000
1,500				1,500
Feb 1 - Feb 28	May 1 - May 31	Aug 1 - Aug 31	Nov 1 - Nov 30	

Graph by:
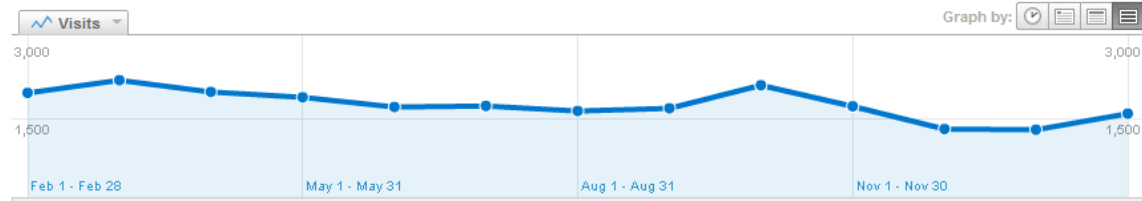
23,116 Visits | **58.82 Visits / Day**

Pageviews for all visitors
Feb 1, 2010 - Feb 28, 2011

Pageviews

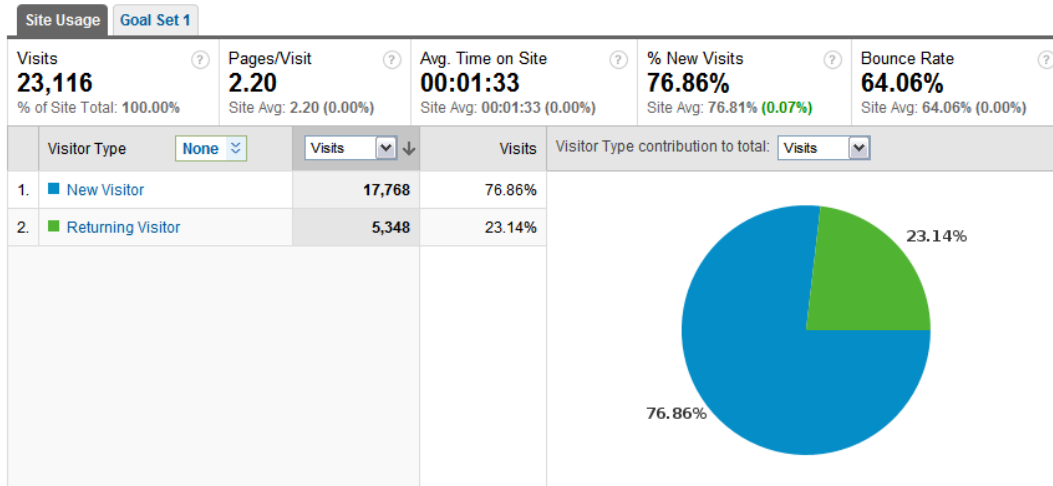| 6,000 | | | | 6,000 |
| 3,000 | | | | 3,000 |
| Feb 1 - Feb 28 | May 1 - May 31 | Aug 1 - Aug 31 | Nov 1 - Nov 30 | |

Graph by:
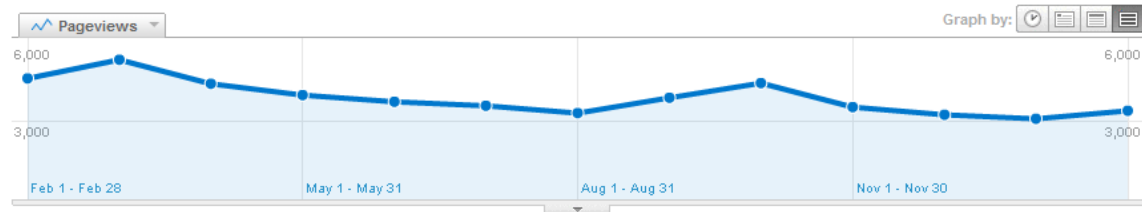
50,856 Pageviews

Average Pageviews for all visitors   2.20 Pages/Visit

Graph 2 (Above): Visitors and Pageviews

23,116 visits from 2 visitor types

	Site Usage	Goal Set 1			
Visits (?) **23,116** % of Site Total: 100.00%	Pages/Visit (?) **2.20** Site Avg: 2.20 (0.00%)	Avg. Time on Site (?) **00:01:33** Site Avg: 00:01:33 (0.00%)	% New Visits (?) **76.86%** Site Avg: 76.81% (0.07%)	Bounce Rate (?) **64.06%** Site Avg: 64.06% (0.00%)

	Visitor Type	None ⌄	Visits ⌄ ↓	Visits	Visitor Type contribution to total: Visits ⌄
1.	■ New Visitor		17,768	76.86%	
2.	■ Returning Visitor		5,348	23.14%	

23.14%

76.86%

Graph 3: Visits by visitor type

All traffic sources sent a total of 23,116 visits

19.58% Direct Traffic

30.26% Referring Sites

50.16% Search Engines

■ Search Engines
11,595.00 (50.16%)

■ Referring Sites
6,994.00 (30.26%)

■ Direct Traffic
4,525.00 (19.58%)

■ Other
2 (0.01%)

Graphs 4 (above) Traffic Sources - February 1, 2010 – February 28, 2011

Top Traffic Sources

Sources	Visits	% visits		Keywords	Visits	% visits
google (organic)	10,404	45.01%		ideanet	1,366	11.78%
(direct) ((none))	4,525	19.58%		center for international rehabilit…	802	6.92%
stumbleupon.com (referral)	1,961	8.48%		idea net	545	4.70%
yahoo (organic)	509	2.20%		ideanet.org	327	2.82%
cirnetwork.org (referral)	504	2.18%		www.ideanet.org	247	2.13%

Graphs 5 (below): Top Traffic Sources - February 1, 2010 – February 28, 2011

| Visits (?) 23,116 % of Site Total: 100.00% | Pages/Visit (?) 2.20 Site Avg: 2.20 (0.00%) | Avg. Time on Site (?) 00:01:33 Site Avg: 00:01:33 (0.00%) | % New Visits (?) 76.86% Site Avg: 76.81% (0.07%) | Bounce Rate (?) 64.06% Site Avg: 64.06% (0.00%) |

	Detail Level: **Country/Territory** ⌄	Visits ↓	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
1.	United States	11,005	2.25	00:01:26	79.05%	61.84%
2.	Bosnia and Herzegovina	1,458	4.03	00:04:22	17.70%	30.25%
3.	India	1,074	2.02	00:01:17	93.02%	67.88%
4.	Canada	994	1.91	00:01:09	84.41%	66.20%
5.	United Kingdom	831	1.86	00:01:10	90.25%	70.88%
6.	France	623	1.36	00:00:35	50.88%	86.52%
7.	Germany	518	1.96	00:01:05	69.69%	72.20%
8.	Mexico	337	1.85	00:00:50	63.50%	74.78%
9.	Brazil	332	1.97	00:01:00	88.25%	75.00%
10.	Italy	318	1.53	00:00:48	87.42%	78.93%
11.	Australia	313	1.80	00:00:44	89.46%	74.44%
12.	Jamaica	286	1.27	00:00:50	81.47%	86.71%
13.	Venezuela	236	1.60	00:01:06	92.37%	72.88%
14.	Pakistan	221	1.67	00:01:18	91.86%	72.40%
15.	Ireland	212	1.94	00:01:07	64.62%	67.45%
16.	(not set)	174	1.71	00:00:43	93.68%	71.84%
17.	Netherlands	170	1.82	00:01:06	84.71%	72.94%
18.	Belgium	164	1.57	00:00:46	59.15%	76.22%
19.	Argentina	154	2.73	00:02:31	67.53%	60.39%
20.	Spain	149	2.19	00:01:42	80.54%	65.77%
21.	Serbia	127	3.11	00:01:37	66.14%	44.88%
22.	Russia	120	1.58	00:00:52	88.33%	76.67%
23.	Colombia	112	2.21	00:01:54	88.39%	67.86%
24.	Egypt	102	1.87	00:01:20	78.43%	75.49%
25.	Switzerland	102	2.48	00:03:48	87.25%	62.75%

Table 3: Site visits by country/nation. 23,116 visits came from 168 countries/territories (February 1, 2010 – February 28, 2011). Above are the top 25 nations listed based on the number of visits.

D2: Further develop and refine iCon store-and-forward system for use in medical consultation.

iCons in Medicine and iConsult

iCons in Medicine is a global telehealth and humanitarian medicine volunteer alliance that uses innovative applications of technology and social networking tools to improve healthcare delivery in remote and medically-underserved areas, and reduce global health disparities. To achieve these goals by leveraging local and regional healthcare providers, and empowering them with tools that can assist in the delivery of care, iCons implemented the iConsult program. iConsult is a teleconsultation environment through which a volunteer network of medical specialists (Volunteers) offer teleconsultation and expert advice to healthcare providers (Requestors) working in remote or medically underserved areas. The program enables communication and information exchange between Volunteers and Requestors who enroll in the program and provides a facility through which expert medical knowledge is available at the point of care, wherever medicine is practiced. Effectively iCons is based on a user registration and vetted membership principle,[60] with users classified as General Members, Volunteers, and Requestors. The membership classification defines the level of access and the features available to a user. In addition, Volunteer and Requestor member credentials are vetted through organizational entities to ensure they are qualified to practice medicine and have the necessary expertise.

The iConsult teleconsultation environment consists of a client and a server component. The client component is a client-server application based on a store-and-forward methodology, using a medical case principle and intended for use by Requestors. It allows Requestors to collect information and document cases at the point of care, irrespective of whether an Internet connection is available. The case information and supporting documentation (images with potential annotations and documents with potential notes) can be uploaded to the server at a later time. The server routes the case to all available Volunteers in the specialty requested. The client-server application also allows for requesting a second opinion on a case from another Volunteer should a Requestor desire another perspective on a case. In the case of a second opinion request, only the original case data is submitted to the iCons Volunteers in the specialty requested, excluding the Volunteer who previously consulted on the case. In this way the confidentiality of the consultation between a Volunteer and a Requestor is protected, and it is up to the Requestor to share information obtained from the Volunteer who initially consulted on the case. This asynchronous communication does not lend itself to working on emergency cases, but is effective for difficult and specialized cases where time is not a critical factor and care can be delivered over a period of days instead of minutes.

In the previous reporting period, the iConsult client-server application (see **Appendix A** for a sample) was further refined to enhance the functionality, usability, and look-and-feel. A detailed set of requirements and Graphical User Interface (GUI) specification was provided to an outside firm tasked with the design and development

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[60] Kamel Boulous, Maged N. and Wheeler, Steve (2007).

of the new version of the application. Currently iConsult is going through the development and testing process, and it is anticipated the new version of will be available for release in Summer 2011, though this release date is dependent on the completion of server-side development.

The server component is a web-based environment, which allows a Volunteer to accept a case and interact one-to-one with a Requestor. The server-side tools enable Volunteers to accept a case in their specialty area and provide advice asynchronously. This advice, usually in the form of messages attached to the case, is received by the Requestor and the communication between the Requestor and the Volunteer continues until the Requestor closes the case. Throughout this process both parties have the ability to add annotations and notes to existing case images and documents, as well as the option to attach additional documentation to the case, in the form of documents, images, or other information.

The server component also provides social networking features, typical of those found on popular social networking sites. Users have the ability to create a profile, which becomes searchable by the community. The level of access to the profile information is determined by the membership level of a user. Members have the ability to create and participate in discussions, start real-time chats, and communicate via email messages with other members. In addition, members can upload documents and other information effectively creating a knowledge center focused around their area of expertise.

An RFP for the re-design and development of the server component was published and proposals have been received from firms bidding on the work. The objective of this effort is to improve the quality of service and usability, enhance functionality, and simplify administration. Specific improvements include:

- Enable business users (non-developers) to update content without coding HTML
- Improve social networking features
- Improve scalability of the back end content management system
- Enable the support of the new client application, and provide better integration
- Enhance security and performance

The iConsult program remains fully functional while upgrades to the application are in progress, and will also remain fully functional when work begins on the website.

As technology constantly evolves, iCons tracks developments and trends and stays current by identifying and embracing those technologies that enjoy wide adoption and stand to offer flexibility and enhanced capabilities to its membership. Currently the popularity of smart mobile devices is paving the way for investigating the integration of a mobile application into the existing iConsult laptop/desktop application.

Program Membership

The current membership in the iCons in Medicine network includes over 400 individuals in 12 countries around the world. These individuals represent 35 academic and medical centers, and include renowned experts in telemedicine, e-health, and global health disparities. Over 130 physicians with expertise in 35 medical specialties (see **Appendix B**) are available to respond to teleconsultation requests from individuals representing over 20 organizations in 10 countries.

Chapters

Chapters are defined as a group of physicians who volunteer as consultants through the iConsult program. They are responsible for recruiting and enrolling qualified physicians as Volunteers in the iConsult program. New Chapters are formed when three or more Volunteers apply to create a Chapter. Currently, iCons in Medicine has 11 Chapters.

Volunteers

Volunteers are physicians who provide free teleconsultations to healthcare providers in remote and medically underserved areas through the iConsult program. All Volunteers enroll through a Chapter. Currently, iCons in Medicine has 134 Volunteer members **(see Appendix C).**

Member Organizations

Member Organizations are groups of healthcare providers who receive teleconsultation services through the iConsult program. They are responsible for recruiting and enrolling Requestors in the iConsult program. Non-profit healthcare delivery organizations operating in remote or underserved areas are eligible to form Member Organizations. Currently, iCons in Medicine has 27 Member Organizations.

Requestors

Requestors are healthcare providers working in remote or underserved areas who request teleconsultations through the iConsult program. All Requestors enroll through a Member Organization. Currently, iCons in Medicine has 52 Requestors **(see Appendix D).**

National Secretariats

National Secretariats recruit and manage Chapters and Member Organizations within a specific geographic area, usually a country. National Secretariats may be formed within an existing entity, such as an academic medical center or major hospital, or as an independent charitable entity established solely for iConsult. Currently, iCons in Medicine has three National Secretariats and four prospective National Secretariats are under review **(see Appendix E).**

Social Networking

During the current reporting period, efforts continue to utilize Social Networking to generate interest in the program and initiate communication and discussion among members.

- E-Newsletter –Every two weeks, the e-newsletter is sent to all members of the iCons in Medicine network, as well as other individuals who have expressed an interest by signing up to receive the e-newsletter. It is sent to over 700 individuals in the healthcare field and other interested parties. Each issue features information about iCons in Medicine members in the news, as well as current Global Health, and Health IT news **(see Appendix F)**.

- Blogging — A blog (weblog) is a website, usually maintained by an individual or organization, with regular entries of commentary, descriptions of events, or other material such as graphics or video. Information on a given Global Health/Health IT topic is posted on three popular blogging websites every two weeks (opposite the e-newsletter). The information is applied to three different websites to ensure broad coverage, as different groups may access each **(see Appendix G)**. Blogs have also been created for the IDRM program on two of these three blogging websites (WordPress, Blogger) to expand the reach of the audience of the program.

- StumbleUpon - An online community that allows its users to discover and rate Webpages, photos, and videos. StumbleUpon is a personalized recommendation engine which uses peer and social-networking principles. Webpages are presented when the user clicks the "Stumble!" button on the browser's toolbar. StumbleUpon chooses which Webpage to display based on the user's ratings of previous pages, ratings by his/her friends, and by the ratings of users with similar interests. To increase traffic to the iCons in Medicine website and information posted on external websites, StumbleUpon has been utilized.

- Facebook – A social networking website where users create a personal profile account and can add friends, send messages, and share links and other information. In addition to a personal profile, Facebook allows users to create Groups and Fan Pages. Facebook Groups are analogous to clubs in the offline world and Pages function like a profile account, but are specific to a brand or organization. A Profile, Group, and Fan Page have been created to extend the network of iCons in Medicine and raise general awareness of the program. Pages and Groups have also been created for the IDRM and the CIR **(see Appendix H)**.

- Twitter – A social networking and microblogging service that enables its users to send and read messages known as "tweets." Tweets are text-based posts of up to 140 characters displayed on the author's profile page and delivered to the author's subscribers who are known as "followers." An iCons in Medicine account has been created and daily updates are posted on technology and health-related topics. This is a further effort to make individuals aware of the program **(see Appendix I)**. A Twitter account has also been created for the IDRM program and updates on disability-related topics are posted frequently.

- Videos - Videos pertaining to the iCons in Medicine program are posted on two video sharing websites (YouTube and Vodpod) **(see Appendix J)**. YouTube Channels have also been created for the CIR and the IDRM program.

Intermittent videos are produced and posted on these channels to generate and interest in the CIR and its programs.

- Photos - Photos and videos are posted on a Flickr account **(see Appendix K).**

iCons Telemedicine Advisory Board (iTAB)
This board consists of 14 leaders in the telemedicine industry. The iTAB meets quarterly via conference call, more often when necessary. Individual board members are contacted as needed for input or advice.

D3: Organize workshops and meetings to expand iCon teleconsultation service and CoPs into underserved areas.

In May 2010 the iTAB hosted a meeting at the ATA annual meeting in San Antonio, Texas. CIR/iCons's Haiti efforts were recapped for the group which initiated the conversation of iCons role in future natural disasters. It was determined that iCons would best function as a "clearing house" providing online pre-coordination for emergencies in these situations. The suggested course of action is as follows:
- Start coordination efforts to prepare for similar events in the future
- Use an Open Content model to provide useful tools to disaster relief healthcare workers
- Pre-qualify organizations to be called upon when a natural disaster strikes
- Encourage participation of iCon volunteers to provide teleconsultations to afflicted areas.

A mobile application development plan was also presented to the iTAB by staff. It outlined how the development of a mobile application would address needs of medics worldwide, through data capture, storage, retrieval, decision support and consultation. MedRed, a medical informatics company, has offered the use of its mobile application to iCons, for this purpose. Patient outreach capabilities have also been discussed, as part of a comprehensive offering, whether deployed in disaster areas or underserved parts of the world. Leveraging the proliferation of mobile phones, it will be possible to provide general prevention information, clinic locations and next steps following a diagnosis and treatment.

The possibility of holding a CIR/iCons conference focused on the Role of Healthcare Information Technology (HIT) to Address Health Disparities was also discussed.

In June 2010, staff exhibited at the American Medical Association Medical Student (AMA-MSS) Medical Specialty Showcase. The purpose of this event is to provide an introduction to various specialties to medical students, and offer promotional materials to assist career decision-making. While one must be a licensed physician to participate in the iConsult program, medical students were encouraged to sign up for iCons in Medicine as a General Member. This allows individuals to interact with others in the healthcare industry using the social networking tools provided until they are qualified to participate in teleconsultations. Approximately 50 students wished to find out more

about iCons, and most took at least the one page handout that showed how medical students could participate in the program as General Members.

Staff also attended the 2010 mHealth Summit held in Washington, DC in November 2010. This event convened leaders in research, technology and policy to share their expertise and draft a blueprint for the future of mobile health.

D4: Continue work on disability rights using IDEAnet for reporting applications.

During the current reporting period, the CIR continued to utilize several social networking outlets to generate interest and encourage participation in the International Disability Rights Monitor (IDRM) project. This social networking outreach includes:

- Blogging — Information on disability and disability rights-related issues is posted on three popular blogging websites intermittently to ensure broad coverage, as different groups may access each. **(see Appendix L)**

- Facebook – A Group and Fan Page have been created to extend the network of IDRM and raise general awareness of its projects. **(see Appendix M)**

- Twitter – An IDRM account has been created and intermittent updates are posted pertaining to disability and rights. This is a further effort to make individuals aware of the program. **(see Appendix N)**

- Videos - Videos pertaining to IDRM projects are posted on YouTube, a popular video sharing website. **(see Appendix O)**

Review of IDRM Methodology

During this reporting period, the International Disability Rights Monitor (IDRM) research methodology was adapted to reflect the Convention on the Rights of People with Disabilities (CRPD). This process included a comprehensive update of the existing IDRM methodology, as well as the establishment of a peer-review group to provide comments and feedback to ensure that the revised methodology was of the highest standards. The peer-review group was comprised of representatives from a number of international disability organizations who have an expertise in disability law and policy and also access to a network of people with disabilities.

Collaborating with other disability organizations and attending a number of international meetings at the UN in 2010 and 2011 have helped IDRM staff to formulate a draft text of the new IDRM methodology for peer-review. The peer-review process included a four-month period during which feedback was given on the newly developed methodology through a project group on the iCons in Medicine website. The iCons online platform enabled the group members to interact with one another and with IDRM staff. Along with the opportunity to exchange ideas and information through the discussion features of the project group, resource materials pertaining to monitoring were also uploaded so that group members had access to up to-date information on the topic. Upon completion of the feedback stage, a final document incorporating the

feedback was circulated to group members. The final document on monitoring disability rights will be circulated to the peer-review group members for distribution among their networks and also will be made available on the IDRM website.

IDRM Special Edition

Work has been ongoing to develop a special edition IDRM publication that will document the process by which the CRPD came to fruition. This new report will capture the evolution and inception of the CRPD, and will gather details from central participants in the process. The IDRM Ireland Coordinator, Mary Keogh, has led the reworking of the IDRM methodology for this special report. Contributors to the report will include: Ambassador Don Mackay; Ambassador de Alba; Ambassador Gallegos; and Professor Gerard Quinn, a noted legal expert on disability. The CIR intends to present this special edition IDRM publication to the Secretary of State as a record of the process that led to the adoption of the Convention. All chapters are to be completed by the beginning of April with tentative publication date set for September 2011. The following are Draft Chapter Working Titles, Content, and Authors:

Chapter 1: The IDRM Journey
Author: Dr. William Kennedy Smith
This chapter discusses the project's successes since its establishment in 2003. It also highlights the key role that civil society must take in monitoring disability rights, and discusses the future plans for the IDRM.

Chapter 2: Making Disability An Issue for International Law
Author: Ambassador De Alba
This chapter discusses the instrumental role that Mexico played in introducing the General Assembly Resolution that established the Ad-Hoc Committee.

Chapter 3: The Early Days
Author: Ambassador Gallegos
This chapter discusses the beginning years of the CRPD negotiations.

Chapter 4: Bringing the Negotiations to An End
Author: Ambassador MacKay
This chapter discusses the different strategies used by to bring about the negotiations.

Chapter 5: The UN Special Rapporteur and the CRPD
Author: Mr. Shuiab Chalklen, UN Special Rapporteur on Disability
This chapter discusses how the role of the UN Special Rapporteur has developed since the adoption of the CRPD.

Chapter 6: The CRPD – Key Legal Issues
Author: Professor Gerard Quinn
This chapter discusses the strategies used to overcome key legal areas during the AD-Hoc negotiations.

Chapter 7: Civil Society's Role
Author: TBD

B. Research and Development of Advanced Distributed Learning Materials

R1: Research existing literature and tools available for program and web design for Open Content development.

The production of Open Content materials ensures that information is able to reach as wide and varied and audience as possible. Open Content materials are defined as materials, often of a creative nature, which are made available for use.[61] This can include images, videos, and text, as well as other types of Open Educational Resources (OERs). The term "Open Content" is often used in conjunction with "Open Source," defined as software for which the code is made publically and freely available.[62] Though they differ in a number of ways, both Open Content materials and Open Source code share the ultimate goal of ensuring that materials and information are made available.

The development and refinement of Open Content materials within online communities has grown increasingly common, due in part to the dramatic increase in the amount of user-generated content that is available online.[63] The success of OERs is dependent on the reliability of the source of the information contained within them.[64] As noted by Kamel Boulos and Wheeler, in an online community, it is often difficult to verify that users are in fact who they claim to be. Though limiting membership to individuals who have been vetted can impact the input users have on OERs, the materials produced are likely to be of higher quality and that the information contained within them is valid and pertinent.

As noted by Ellaway and Martin, Open Content materials possess a level of sustainability that other resources may not,[65] and like Open Source software, also allows for significant cost-savings as they are less costly to maintain.[66] The collaborative process involved in the development and refinement of OERs and other materials ensures that these materials will have a wide distribution. By involving individuals from different cultures and backgrounds in the process of creating OERs, these individuals can be empowered "with the ability to recontextualize the material, translate it into their own language and take ownership of it"[67] and are likely to share the materials with peers outside of the OC within which they were created.

In addition to web-based delivery of OERs, mobile devices can provide an alternative method of delivery. According to experts, the number of mobile devices in use

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[61] As defined by Sharing Resources in Education (SHARE) (http://www.share.uni-koeln.de/?q=en/glossary/29).

[62] As defined by Princeton University (http://wordnetweb.princeton.edu/perl/webwn?s=).

[63] Cheliotis, Giorgos (2009). From open source to open content: Organization, licensing and decision processes in open cultural production. *Decision Support Systems*, 47: 229-244.

[64] Remmele, Bernd (2006). Open Educational Resources – anonymity vs. specificity. *European Journal of Open, Distance, and E-Learning*. Accessed online 11/8/2010 - http://www.eurodl.org/?p=archives&year=2006&halfyear=2&article=245

[65] Ellaway, Rachel and Martin, Ross D. (2008). What's mine is yours – open source as a new paradigm for sustainable healthcare education. *Medical Teacher*, 30: 175-179.

[66] Strom, David. "Open-Source Software, Now." *Baseline Magazine*. Updated October 15, 2010. Accessed Online 11/9/10 - http://www.baselinemag.com/c/a/Application-Development/OpenSource-Software-Now-280193/

[67] Baraniuk (2006) as noted by Ellaway and Martin.

worldwide is increasing, and they are becoming a "part of the 'digital life' for many individuals around the world.[68] Further reports indicate that there are an estimated 4.6 billion mobile phone users worldwide with three-quarters of these individuals in developing nations,[69] and Ericsson reports that mobile broadband subscriptions are on track to surpass one billion by 2011.[70] In some regions, a reliable Internet connection may not be available, though mobile devices may be commonplace. Though only a reported 16 of Palestinian households have Internet access, a 2009 United Nations report indicates that 81 percent have a cell phone.[71] It is important to note that in many regions, just as reliable Internet connectivity may be problematic, only simple devices that allow for calls and texting are available.[72] For healthcare providers in the developed world, smartphones and mobile devices have become increasingly common,[73] and a reported 72 percent of physicians are utilizing smartphones personally and professionally.[74]

Continued efforts have been made to improve the iCons in Medicine website to ensure that it is user-friendly and that materials and information are provided in a manner that meets users' needs. The iCons in Medicine program software is currently undergoing large-scale revisions in order to ensure its usability. These updates have been based on user feedback and on extensive testing of the teleconsultation process. In addition, the possibility of creating a mobile application to be paired with the existing website and desktop application has been explored, and updates to both the website and software have been geared towards this future integration.

D1: Continue to develop and/or refine educational materials.

During this reporting period the CIR worked with its partner the University Clinical Center Tuzla (UKC), the Association of Physiatrist from the Federation of Bosnia and Herzegovina (BiH), and the Association of Physiatrists of the Republic Srpska to organize the Third International Congress of BiH Physiatrists. The three-day Congress was successfully organized in October 2010.

As part of the Congress, the CIR and the UKC organized the First International Society for Prosthetics and Orthotics (ISPO) Conference in the BiH. International experts from Europe and the United States participated in the Congress and exchanged current

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[68] Churchhill, Daniel and Hedberg, John (2008). Learning object design considerations for small-screen handheld devices. *Computers & Education*, 50: 881-893.

[69] The Economist. "Mobile Work: A way to earn money by texting." *The Economist*. Updated: October 28, 2010. Accessed online 11/9/10 - http://www.economist.com/node/17366137?fsrc=scn%2Ftw%2Fte%2Frss%2Fpe&story_id=17366137

[70] *Reuters Onlin*. "Mobile broadband users seen hitting 1 billion in 2011" Updated: January 11, 2011. Accessed online 1/19/11. http://www.reuters.com/article/idUSTRE70A2JS20110111

[71] Lloyd, Robin. "Mobile Phones for Women: A New Approach for Social Welfare in the Developing World" *Scientific American*. Updated: December 17, 2010. Accessed online – 1/19/11. http://www.scientificamerican.com/article.cfm?id=mobile-phones-for-women

[72] Giridharadas, Anand. "Where a Cellphone Is Still Cutting Edge." *The New York Times*. Updated April 10, 2010. Accessed Online 11/9/10 - http://www.nytimes.com/2010/04/11/weekinreview/11giridharadas.html

[73] CSC. "CSC Launches UK Mobile Solution for Healthcare Workers on Blackberry Smartphones." *eHealthNews.eu*. Updated: October 12, 2010. Accessed Online 11/9/10 - http://www.ehealthnews.eu/csc/2290-csc-launches-uk-mobile-solution-for-healthcare-workers-on-blackberry-smartphones

[74] Dolan, Pamela Lewis. "Physician smartphone popularity shifts health IT focus to mobile use." *American Medical News*. Updated: August 23, 2010. Accessed Online 11/9/2010 - http://www.ama-assn.org/amednews/2010/08/23/bil10823.htm

scientific knowledge to improve the quality of life of individuals with disabilities in the Balkan Region. During the Congress, a total of 13 prosthetic and orthotic related lectures were presented. The topics covered included the following:

- Post-Operative Management of the Residual Limb
- Treating X-Rays or Patients – Reestablishing Balance
- Body Alignment and Spine Stability
- Prosthetic Prescription Principles
- Cost-Effective Prosthetic Technologies
- Addressing the Needs for P&O Education for Members of the Rehabilitation Team

In addition, during the current reporting period, the following training modules were adapted to ensure cultural appropriateness, expanded to include addition clinically-related information, and translated into Bosnian:

1. Disability and Rehabilitation - Includes basic information on how a rehabilitation clinics help coordinate the participation of the various specialists involved in the integrated rehabilitation process of an individual with a disability. Describes the major functions of rehabilitation clinic such as: coordinating the pattern of treatment and educating the involved staff and the patients.

2. Anatomy of the Spine – This training module contains basic human anatomy, and describes each region of the spine, its functions and characteristics and also includes basic information on the ligaments, vertebral bodies, and muscles.

3. Biomechanics of the Spine - Provides an overview of the vertebral bodies of the cervical, thoracic, and lumbar regions including the functions of each vertebral body, cervical spine, goniometry, and various movements in the planes and axes of the human body.

4. Pathologies of the Spine – This section describes common pathologies affecting the spine such as idiopathic and congenital scoliosis. It includes information on clinical manifestations, diagnosis, tests, and techniques used to measure the spinal curves and orthotic treatment. Other pathologies like kyphosis, spondylolisthesis, spondylolysis, Potts's disease, and common injuries are also included, as well as recommended interventions and treatment.

5. Cervical and Spinal Clinical Considerations – Provides recommendations for the use of cervical and spinal orthoses in the treatment of traumatic injuries and pathologies. Includes biomechanical principles used to provide pain management and positional control, such as the principle of the three-point system.

6. Overview of Cervical & Spinal Orthotics – The goal of this section is to provide an overview of cervical and spinal orthotics. It includes the different categories used to describe the treatment of the cervical and spinal regions, and provides information on the type of spinal orthoses most commonly used to provide pain management, support, and motion control. It includes information on the designs and application of metal and

plastic lumbosacral (LSO), thoracolumbosacral (TLSO), and cervico-thoracolumbosacral orthoses (CTLSO), and on how they are used to reposition the spine into a more anatomically correct alignment, as in the case of scoliosis.

7. Cervical & Spinal Orthotics Treatment – Provides information on how to fit a cervical orthosis and on how to make a custom fitted thoracolumbar sacral spinal orthosis (TLSO). Also provides a basic understanding of the cervical and spinal orthotics classification and their different designs and fitting principles, and information on how to identify the anatomical landmarks that are used as references for proper measurement and custom fabrication of a TLSO.

8. Anatomy of the Upper Extremities - This module provides an overview of the upper extremity anatomy that is used in the fabrication of an upper extremity orthosis. It describes the functions of the muscle groups, the nerves that innervate them, and facilitates the understanding of the changes in movement and of the type of assistance that the orthosis will provide to the patients, according to his/her capacity and/or needs.

9. Biomechanics of the Upper Extremities – This training module provides a basic understanding of the biomechanics of the upper extremity and of its applications in evaluation of a patient and in the manufacturing of an orthosis. It describes how to effectively apply biomechanical principles when evaluating a patient for an orthosis, and on how to identify anatomical structures. This section also provides an understanding of range of motion (ROM) of the upper extremities, and on how to achieve a functional ROM (not necessarily a full ROM).

10. Clinical Considerations - This module provides information about injuries and illnesses to support knowledge and understanding of the most common conditions that affect the body structures and function of the upper extremity. Musculoskeletal conditions and neurological disease can benefit from the timely indication of a properly manufactured orthotic device. Various injury types, including fractures, dislocations, sprains, tendinitis, and degenerative processes that can be caused by trauma, mechanical stress, disease, or aging joints can be seen in the upper extremity. Also, certain conditions of the nervous system can affect the functional level of the upper extremity. Fractures, joint disease, periarticular disorders (rotator cuff tear), central nervous system and peripheral nerve injuries are all described and discusses in this module.

11. Principles and Components – This module describes the different categories, and components of upper limb orthosis systems currently available and provides information of whether their primary purpose is therapeutic or functional. It provides the necessary information to categorize upper limb orthosis by different pathologies (e.g., spinal cord injury, arthritis, trauma, head injury), joint encompassed (e.g., shoulder, elbow, wrist), or treatment objective (e.g., promote healing, prevent deformity, enhance function). It also explains how to categorize upper limb orthosis by static and dynamic, and subcategorize them as either functional of therapeutic.

12. Wrist Hand Orthosis - Provides information on how to cast, and fabricate a static wrist hand orthosis to support the wrist joint, maintain the functional arquitecture of the hand, and prevent wrist-hand deformities. This module also discusses the use of

therapeutic attachments, such as metacarpophalangeal (MCP) extension stops, interphalangeal (IP) extension assists, and thumb extension assists.

Module I: Anatomy of Spine III	June 1 - June 15, 2010
Module II: Biomechanics of the Spine III	June 16 - June 30, 2010
Module III: Pathology -Spinal Orthotics III	August 1 - August 16, 2010
Module IV: Clinical Consideration, Spinal Orthotics	August 17 - September 1, 2010
Module V: Overview of Cervical & Spinal Orthotics	September 2 – Sept. 30, 2010
Module VI: Cervical & Spinal Orthotics Treatment	October 1 - October 15, 2010
Module I: Anatomy of the Upper Extremities	December 1 - December 15, 2010
Module II: Biomechanics of the Upper Extremities	December 15 - Dec. 31, 2010
Module III: Upper Extremity Clinical Consideration	January 1, 2011-January 15, 2011

In October 2010, a three-day Spinal Orthotic Practical and Theoretical evaluation was conducted under the supervision of Hector Casanova, CPO/L from CIR Chicago and Mr. Michael Quigley, CPO/L, CIR's Prosthetics & Orthotics consultant.

During the Congress, a total of 13 Prosthetic and Orthotic related lectures were presented. Some of the topics included the following: Post-Operative Management of the Residual Limb, Treating X-Rays or Patients – Reestablishing Balance, Body Alignment and Spine Stability, Prosthetic Prescription Principles, Cost-Effective Prosthetic Technologies, and Addressing the Needs for P&O Education for Member of the Rehabilitation Multidisciplinary Team.

As part of activities associated with the Spinal Orthotics training program, a one-day hands-on technical workshop was organized at the UKC Prosthetics and Orthotics Training Center in Tuzla. Dr. Jose Miguel Gomez, one of the leading experts in the treatment of Idiopathic Scoliosis in the U.S., was invited to share his clinical expertise with the students and UKC's prosthetics and orthotics staff. Other members of the Rehabilitation Multidisciplinary Team, including the Head of the UKC's Orthopedic Surgery department and UKC's Physical Medicine & Rehabilitation and Physical Therapists attended and actively participated in the evaluation of three children with idiopathic scoliosis. With the assistance of the CIR and UKC staff, Dr. Gomez took an impression, fabricated, and delivered a Thoraco Lumbar Sacral Orthosis (TLSO) to the patients.

D2: Continue to encourage the collaboration of Open Content methodologies to develop and disseminate materials

The incorporation of EMR capabilities into the iCons collaboration and teleconsultation environment is under consideration, to allow patient information to be readily available by physicians and allow for the provision of improved care. A number of open source EMR systems have been considered, among them OpenEMR and OpenMRS, but to date no decision has been made to move forward with making this functionality available. Before this functionality can be added, a number of questions would first

need to be addressed, including the data retention policy, confidentiality and security, HIPAA implications.

The two EMR applications which were investigated are described in the following paragraphs. Of the two, OpenEMR is a more full-featured application best suited for managing the activities of a medical practice/clinic. OpenMRS offers features which make it easier to support data collection and analytics on the collected data.

OpenEMR

The Open Electronic Medical Record application is a platform that supports medical practice management, electronic medical records, prescription writing and medical billing. OpenEMR also provides a robust security model, HIPAA compliance, and support for ANSI X12 and HL7. This is a full-feature application that allows for the management of all the functions around the operation of a medical practice/clinic. Thus, medical claims and accounts receivable are features of the application, along with a calendar for managing appointments, customizable forms for medical encounters, document management for electronic or scanner records, plus support for voice recognition. OpenEMR also offers a web front-end for easy access from anywhere, through a browser.

OpenMRS

The Open Medical Record System is a software platform which enables users to design a customized medical record system. It is a platform that can support medical informatics since its concept is to limit the use of free text and use coded information. It is based on a concept dictionary which defines all diagnosis, tests, procedures, tests, drugs and other general questions and potential answers. Thus it enables a user to customize the system for different uses, since there is no direct dependence on actual types of medical information or specific data collection forms. OpenMRS can also support a number of simultaneous users, since it is a client-server application, as well as offering a web front-end, making it easily accessible through a browser.

C. Research and Delivery of ADL

R1: Research and evaluate existing empirical literature of appropriate locales for online delivery of educational services.

According to Ferdig, et al., "technology continues to link diverse cultures by reducing temporal and spatial separation."[75] According to experts, the feelings of social isolation commonly associated with the geographic separation of students can be mitigated in part through the use of computer-supported collaborative learning (CSCL) or Advanced Distributed Learning (ADL).[76] These modes of teaching not only allow students to feel somewhat connected to their peers, but also to control the speed of their learning and

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[75] Ferdig, et al. (2007).
[76] Kamel Boulous and Wheeler (2007).

ensure that previous knowledge can be connected to newly acquired information.[77] Though similar in many respects, CSCL emphasizes the importance of supporting collaboration between students, while ADL focuses primarily on the access to and individualization of materials to ensure that content is useful to the audience.

In both CSCL and ADL systems, the use of both synchronous and asynchronous modes of communication allow instructors the ability to provide information to students without restrictions of time and space.[78] Recent advancements in information and communications technologies (ICT) have led to the development of systems within which course materials can be placed online for retrieval or distributed to students directly.[79] The distribution of materials online allows for significant reductions in costs associated with reproduction, and frequently the only costs associated with materials used for ADL courses is that of their initial production. This type of system has recently been implemented in the Chicago Public Schools system through the pilot program of the Additional Learning Opportunities (ALO) program.[80] By adding an online portion to the students' schedule, it will be possible to provide students with additional educational material while limiting costs associated with teachers and printed materials.

Materials made available through ADL are specified by the Sharable Content Objects Reference Model (SCORM), which makes it possible to use, share, and reuse these materials without requiring a standardized computer configuration, operating system, or browser. Materials that are SCORM-compliant include metadata to describe the course content, ensuring that they can be quickly and easily identified.[81] In addition, experts note the importance of ensuring that materials intended for online distribution to a disparate audience be created with attention paid to a number of factors to ensure their usability. These include: 1. Dialog and Social Interaction Support (the ease with which commands can be executed), 2. Information Design (how easy to read and interact with a website is), 3. Navigation (the ease with which a user can find the information they are seeking), and 4. Access (requirements for using a website, this is particularly important if a site requires a high-bandwidth connection).[82]

R2: Conduct literature review and evaluation of cost-effective delivery options including those based on licensing, consulting, tuition, and train-the trainer methodologies.

Findings of recent studies indicate that a distance learning approach can achieve similar education performance results to traditional face-to-face models.[83] Additional research comparing one-on-one tutoring and classroom instruction found a student achievement

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[77] Liaw, et al. (2008)

[78] Riverin and Stacey (2008).

[79] Caswell, Tom; Henson, Shelley; Jensen, Marion; and Wiley, David (2008). Open Educational Resources: Enabling universal education. *International Review of Research in Open and Distance Learning*. 9(1): 1-11.

[80] City of Chicago Mayor's Press Office. "Mayor Daley, CPS Officials Announce Pilot Program To Add 90 Minutes Of Online Learning Time To School Day." Updated August 24, 2010. Accessed Online 11/9/10 - http://mayor.cityofchicago.org/mayor/en/press_room/press_releases/2010/august_2010/0824_cps_additional.html

[81] Li, Qing; Lau, Rynson W.H.; Shih, Timothy K; and Li, Frederick W.B. (2008). Technology Supports for Distributed and Collaborative Learning over the Internet. *ACM Transactions on Internet Technology*. 8(2):10.

[82] Preece, Jenny (2001). Sociability and usability: Twenty years of chatting online. *Behavior and Information Technology Journal.* 20(5): 347-356.

[83] Li, et al. (2008).

difference of two standard deviations in favor of tutorial instruction.[84] While this method is preferable, Fletcher, et al. note that it is not possible to provide a human tutor to every student and maintain a cost-effective model. By employing education technologies that allow materials to be tailored to suit the needs to students, a system similar to direct tutoring can be established while also ensuring that it is affordable and globally accessible.

According to a study to assess the costs needed to achieve a common instructional outcome conducted by Fletcher, et al. (1990), the most cost-effective approaches to instruction were found to be computer-based and peer tutoring. The comparative study examined tutoring by professionals, peer tutoring, reducing class size, increasing instructional time, and using computer-based instruction. Though Fletcher, et al.'s findings indicate that a computer-based approach is ultimately the most cost-effective, other similar studies indicate that a combination of peer tutoring and computer-based instruction provides a greater benefit to students than online instruction alone.[85]

Historically, the CIR has used a "blended learning" approach to deliver training materials pertaining to prosthetic and orthotic fabrication techniques. It is likely that as ICT continues to advance, these courses will employ more online delivery and formal hands-on workshops will be phased out. Through e-learning systems, including Moodle, WebCT, and Blackboard, course materials can be managed effectively by instructors and delivered to students. In addition to simplifying the process of tracking students' progress and communicating with students, these systems allow students to access materials according to their availability.[86]

The iCons in Medicine program also relies on web-based interaction as opposed to face-to-face meetings to improve patient care. Though the program is primarily focused on communication between healthcare providers and specialty physicians via teleconsultation, it treats all participants as peers within a network with the common goal of sharing information and knowledge to ensure the provision of quality care.

D1: Stage regional IDEAnet conferences and meetings of experts in disability and rehabilitation in the Western Balkans, the Middle East and other regions.

As mentioned in section A: D3, the possibility of CIR/iCons holding a Conference focused on Role of HIT to Address Health Disparities was discussed at length during the May 2010 iTAB meeting. It was agreed that hosting an annual one-and-a-half day conference with the major focus application of HIT would prove to be beneficial to the program, its membership, and other interested parties within the health and technology fields. Details and planning for this proposed conference have not yet been finalized.

Additionally, as mentioned in section B:D1, the CIR worked with the University Clinical Center Tuzla (UKC), the Association of Physiatrist from the Federation of Bosnia and Herzegovina (BiH), and with the Association of Physiatrists of the Republic

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[84] Bloom, B. (1984) as per Fletcher, J.D.,;Tobias, S.; and Wisher, R. (2007). Learning Anytime, Anywhere: Advanced Distributed Learning and the Changing Face of Education. *Educational Researcher*, 36(2): 96-102.
[85] Fletcher, et al. (2007)
[86] Ibid.

Srpska, to organize the Third International Congress of BiH Physiatrists. The three-day Congress was successfully organized in October 2010.

D2: Deliver educational materials in post-conflict areas as ancillary funding permits.

During the current reporting period the CIR continued to work with the University Clinical Center Tuzla (UKC) to provide training and education to rehabilitation professionals in the Balkan region. The training program delivered during this period included courses on upper and lower extremity orthotics, as well as spinal and cervical orthotics. The training was delivered in a format that combined online components with hands-on practical workshops and evaluations. The result was the delivery of high-quality education for orthotic technicians and improved provision of services for landmine survivors and other individuals with disabilities. The following online provides an overview of the training materials delivered through CIR's International Disability Educational Alliance Network (IDEAnet) website:

Lower Extremity Orthotics II (February 2010 – May 2010)
Module I   Lower Extremity Anatomy II
Module II   Lower Extremity Pathology II
Module III   Knee Ankle Foot Orthotics
Module IV   Overview of Hip-Knee-Ankle-Foot Orthosis (HKAFO),
                       Hip Orthosis, Knee Orthosis, and Rotational Control Orthosis

Spinal and Cervical Orthotics (June 2010 – November 2011)
Module I   Anatomy of the Cervical and Spinal Regions
Module II   Biomechanics of the Spine
Module III   Pathology of the Spine
Module IV   Clinical Considerations
Module V   Overview of Cervical & Spinal Orthotics
Module VI   Cervical & Spinal Orthotics Treatment

Upper Extremity Orthotics (December 2010 – February 2011)
Module I   Anatomy of the Upper Extremities
Module II   Biomechanics of the Upper Extremities
Module III   Clinical Considerations

During this reporting period three hands-on practical evaluations were organized and conducted in collaboration with the UKC, and a practical training session of a one-stage circumferential casting technique use to fabricate a Thoracolumbar Sacral Orthosis (TLSO), as well as the modification, fabrication and fitting process of the orthosis was organized and conducted at the UKC's Prosthetics and Orthotics Training Center in Tuzla. The CIR also furthered efforts led by Hector Casanova, CP/L to collaborate with the UKC to develop, refine, and deliver spinal and upper extremity training materials. A total of 13 training modules were delivered to 21 students from the region.

As part of the clinical training provided to the students and rehabilitation staff, several multidisciplinary clinical evaluations of children and adults with various musculoskeletal disabilities were organized during this period to help addresses

questions and clinical consideration that the medical staff had regarding specific clinical cases. Physical therapists and physical medicine and rehabilitation staff were involved in the evaluations and members of the families of the people with disabilities interacted with CIR staff and technical consultants.

Key Research Accomplishments

- Investigated of the possibility of supporting a data collection/mobile health program pilot project in Kenya with the Field Epidemiology and Laboratory Program Alumni Association (FELP-AA).

- Researched and solicited outside firms to reconstruct the website as part of the overall effort to improve the quality of service, upgrade functionality, and simplify administration.

- Investigated the used of smart mobile devices for integration of a mobile application into the existing iConsult laptop/desktop application.

- Researched the possibility of holding a CIR/iCons conference focused on the Role of Healthcare Information Technology (HIT) to Address Health Disparities.

- Investigated iCons' role in future natural disasters. It was determined that iCons would best function as a "clearing house" providing online pre-coordination for emergencies in these situations.

REPORTABLE OUTCOMES

- Established iConsult Chapters to allow physicians to designate their desire to provide consultations to medical personnel working in areas affected by the natural disasters that struck Haiti and Pakistan.

- Adapted P&O training modules for cultural aspects, additional clinically related information, and translation into Bosnian.

- Continued tracking of developments and trends to stay current by identifying and embracing those technologies that are widely adopted and stand to offer flexibility and enhanced capabilities to its membership of the program.

- Continued building Social Networking to generate interest in the iCons in Medicine program and initiate communication and discussion among members. Activities include: refinement of the bi-monthly newsletter; expansion of a bi-monthly blog that is posted on three different websites to ensure broad coverage; increase traffic to the iCons in Medicine website through StumbleUpon; continued use of Facebook profile, groups, and fan pages; continued daily updates on Twitter; intermittent videos produced and posted on YouTube channels to generate and interest in the CIR and its programs.

- Delivered of 12 online training modules in Prosthetics and Orthotics

- Provided upper and lower extremity and spinal and cervical orthotics training and education through online and hands-on practical workshops to rehabilitation professionals in the Balkan region.

- Refinement of the iConsult client-server application to enhance the functionality, usability, and aesthetics.

- Organized and executed the Third International Congress of BiH Physiatrists in coordination with the University Clinical Center Tuzla (UKC), the Association of Physiatrist from the Federation of Bosnia and Herzegovina (BiH), and the Association of Physiatrists of the Republic Srpska. The three-day congress was held in October 2010 in Tuzla, BiH. During this Congress, the CIR helped to coordinate the First International Society for Prosthetics and Orthotics (ISPO) Conference in which international experts from Europe and the United States participated and exchanged current scientific knowledge to improve the quality of life of individuals with disability in the Balkan Region.

- Continued the utilization of several social networking outlets to generate interest and encourage participation in the International Disability Rights Monitor (IDRM) project: Blogging, Facebook, Twitter, and YouTube.

- Adapted the International Disability Rights Monitor (IDRM) research methodology to reflect the Convention on the Rights of People with Disabilities (CRPD).

- Continued development of a special edition of the IDRM publication to document the history of the Convention on the Rights of People with Disabilities, which has an anticipated publication date of September 2011.

- Continued growth and maintenance of the iCons in Medicine Membership.

- Continued work with the iTAB, which is composed of leaders in the telemedicine industry who meet monthly in order to create a volunteer support network for the iCons in Medicine program

Conclusions

Historically, the CIR has worked to provide technical assistance, education, and training to medical practitioners in medically underserved areas. During the current reporting year, the CIR continued to utilize its experience distributing learning materials; conducting hands-on workshops aimed at transferring appropriate rehabilitation technologies; promoting interaction between rehabilitation professionals; and providing solutions through the development of tools, core curricula, and strategic plans that address the needs of people with disabilities, and the war-wounded population. These ongoing efforts have led to the delivery of 12 online training modules in Prosthetics and Orthotics, prosthetic demonstrations and hands-on practical

evaluations in Tuzla, BiH. Through these training efforts, the CIR hopes to ensure that the needs of people with disabilities are met in areas worldwide where access to quality medical care and rehabilitation services are limited.

The CIR's use of Social Media continues to grow, resulting in an increased awareness and interest in the iCons in Medicine program. Over 700 healthcare professionals receive a bi-monthly e-newsletter from iCons in Medicine, and these individuals and other interested parties respond to materials distributed through Facebook, Twitter, blogs, and videos posted online. These external social networking outlets have also been utilized to share information about the IDRM project, and to generate interest and encourage participation it. Information posted online by the CIR is frequently reposted by others, further increasing the audience that is exposed to these materials.

To date, over 400 professionals in the medical industry have become members of iCons in Medicine. Half of these participants have elected to join the "iConsult" program, allowing them to provide and receive teleconsultations through iCons in Medicine. The program has been structured in such a way that participants are organized and recruited via groups within their geographic region Taking into consideration user feedback, iTAB input and extensive testing of the teleconsultation process, the iConsult client-server application, through which teleconsultations are submitted, is in the process of being revamped with enhanced capabilities. The result will be a more user-friendly application. Once completed, an overhaul of the website, used by Volunteers to respond to teleconsultation requests, will take place to compliment the updated client-server application. To further expand the program, the possibility of creating a mobile application to be paired with the existing website and desktop application has been explored, and the aforementioned updates to both the website and software have been geared towards this future integration.

It is anticipated that through increased social networking efforts and ongoing refinement of the iCons in Medicine website and software application, it will be possible to ensure a strong and sustainable network. Through this network, it will be possible to share and disseminate new knowledge, information, and ideas, and to ensure the provision of quality health services worldwide through telemedicine.

References

Baumann, Phil. "140 Health care Uses for Twitter." Updated: January 16, 2009. Accessed online 3/8/10 - http://philbaumann.com/2009/01/16/140-health-care-uses-for-twitter/

Breen, Kerri. "Wake up, social media users, we're crushing our creation." *CBC News*. Updated: April 28, 2009. Accessed online 3/8/10 - http://www.cbc.ca/canada/story/2009/04/27/f-vp-breen.html

Caswell, Tom; Henson, Shelley; Jensen, Marion; and Wiley, David (2008). Open Educational Resources: Enabling universal education. *International Review of Research in Open and Distance Learning*. 9(1): 1-11.

Chen, Pauline W. "Medicine in the Age of Twitter." *The New York Times*. Updated: June 11, 2009. Accessed online 3/8/10 - http://www.nytimes.com/2009/06/11/health/11chen.html

Cheliotis, Giorgos (2009). From open source to open content: Organization, licensing and decision processes in open cultural production. *Decision Support Systems*, 47: 229-244.

Churchhill, Daniel and Hedberg, John (2008). Learning object design considerations for small-screen handheld devices. *Computers & Education*, 50: 881-893.

Cimpanu, Catalin. "Twitter Embraced by the Medical Community." *Softpedia*. Updated: August 25, 2009. Accessed online 3/8/10 - http://news.softpedia.com/news/Twitter-Embraced-by-the-US-Medical-Community-120041.shtml

Ellaway, Rachel and Martin, Ross D. (2008). What's mine is yours – open source as a new paradigm for sustainable healthcare education. *Medical Teacher*, 30: 175-179.

Eysenbach MD MPH, Gunther (2008). Medicine 2.0: Social Networking, Collaboration, Participation, Apomediation, and Openness. *Journal of Medical Internet Research.* July-September; 10(3): e22.

Fletcher, J.D.,;Tobias, S.; and Wisher, R. (2007). Learning Anytime, Anywhere: Advanced Distributed Learning and the Changing Face of Education. *Educational Researcher*, 36(2): 96-102.

Granovetter, Mark (1983). The Strength of Weak Ties: A Network Theory Revisited. *Sociological Theory*, 1: 201-233.

Harmaakorpi, Vesa and Mutanen, Arto (2008). Knowledge Production in Networked Practice-based Innovation Processes – Interrogative Model as a Methodological Approach. *Interdisciplinary Journal of Information, Knowledge, and Management*, 3: 88-101.

He, Wei; Qiao, Qian; and Wei, Kwok-Kee (2009). Social relationship and its role in knowledge management systems usage. *Information & Management*, 46: 175-180.

Johnson, Joalien. "Medical Groups Catch the Twitter Bug." *TSW, Tradeshow Week*. Updated: September 2, 2009. Accessed online 3/8/10 - http://www.tradeshowweek.com/index.asp?layout=talkbackCommentsFull&talk_back_header_id=6618473&articleid=CA6687349

Kamel Boulous, Maged N. and Wheeler, Steve (2007). The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education. *Health Information and Libraries Journal*, 24: 2-23.

King, William R. and Marks Jr., Peter V. (2008). Motivating knowledge sharing through a knowledge management system. *Omega*, 36: 131-146.

Lau, Adela and Tsui, Eric (2009). Knowledge management perspective on e-learning effectiveness. *Knowledge-Based Systems*, 22: 324-325.

Li, Qing; Lau, Rynson W.H.; Shih, Timothy K; and Li, Frederick W.B. (2008). Technology Supports for Distributed and Collaborative Learning over the Internet. *ACM Transactions on Internet Technology*. 8(2):10.

Liaw, Shu-Sheng; Chen, Gwo-Dong; Huang, Hsiu-Mei (2008). Users' attitudes toward Web-based collaborative learning systems for knowledge management. *Computers and Education*, 50: 950-961.

McFadyen, M. Ann; Semadeni, Matthew; and Cannella Jr., Albert A. (2009). Value of Strong Ties to Disconnected Others: Examining Knowledge Creation in Biomedicine. *Organization Science*. 20(3), May-June; 552-564.

McGee, James B. and Begg, Michael (2008). What medical educators need to know about "Web 2.0." *Medical Teacher*. 30: 164-169.

Orzano, John A.; McInerney, Claire R.; Scharf, Davida; Tallia, Alfred F.; and Crabtree, Benjamin F. (2008). A Knowledge Management Model: Implications for Enhancing Quality in Health Care. *Journal of the American Society for Information Science and Technology*, 59(3): 489-505.

Preece, Jenny (2001). Sociability and usability: Twenty years of chatting online. *Behavior and Information Technology Journal.* 20(5): 347-356.

Remmele, Bernd (2006). Open Educational Resources – anonymity vs. specificity. *European Journal of Open, Distance, and E-Learning*. Accessed online 3/11/2010 - http://www.eurodl.org/?p=archives&year=2006&halfyear=2&article=245

Scott, Katie. "How Twitter helps doctors do their jobs." *Wired UK*. Updated: August 26, 2009. Accessed online 3/8/10 - http://www.wired.co.uk/news/archive/2009-08/26/how-twitter-helps-doctors-do-their-jobs-.aspx

Soubhi MD PhD, Hassan; Bayliss MD MSPH, Elizabeth, A.; Fortin MD MSc CMFC, Martin; Hudon, MD CMFC, Catherine; van den Akker PhD, Marjan; Thivierge MD,

Robert; Posel RN Med, Nancy; Fleiszer MD, David (2010). Learning and Caring in Communities of Practice: Using Relationships and Collective Learning to Improve Primary Care for Patients with Multimorbidity. *Annals of Family Medicine*. 8(2): 170-177.

Sutton, 2001; Preece, Nonnecke and Andrews, 2004 per Riverin, Suzanne and Stacey, Elizabeth (2008). Sustaining and Online Community of Practice: A Case Study. *Journal of Distance Education*, 22(2): 43-58.

Thompson MD MS, Lindsay, A.; Dawson PhD, Kara; Ferdig PhD, Richard; Black MA, Erik W.; Boyer Med, J.; Coutts Med, Jade; and Black MD, Nicole Paradise (2008). The Intersection of Online Social Networking with Medical Professionalism. *Journal of General Internal Medicine*. July; 23(7): 954-957.

USAToday, Science Fair. "Doctors: A Tweet a day keeps the patients informed." Updated: August 24, 2009. Accessed online 3/8/2010 - http://content.usatoday.com/communities/sciencefair/post/2009/08/68497630/1

Wenger, Etienne C. and Snyder, William M. (2000). Communities of Practice: The Organizational Frontier. *Harvard Business Review*. January-February 2000: 139-145.

Wilensky, Hiroko; Su, Norman Makoto; Redmiles, David; and Mark, Gloria (2008). *A Community of Knowledge Management Practioners: Mirroring Power across Social Worlds*, in IFIP International Federation for Information Processing, Volume 270; *Knowledge Management in Action*, Mark Ackerman, Rose Dieng-Kuntz, Carla Simone, Volker Wulf; (Boston: Springer), pp. 195-207.

Wortham, Jenna. "Baby Boomers, Luddites? Not So Fast." *The New York Times*. Updated: February 20, 2009. Accessed online 3/8/10 - http://bits.blogs.nytimes.com/2009/02/20/baby-boomers-luddites-not-so-fast/

Yang, Shih-Hsien (2009). Using Blogs to Enhance Critical Reflection and Community of Practice. *Educational Technology & Society*, 12(2): 11-21.
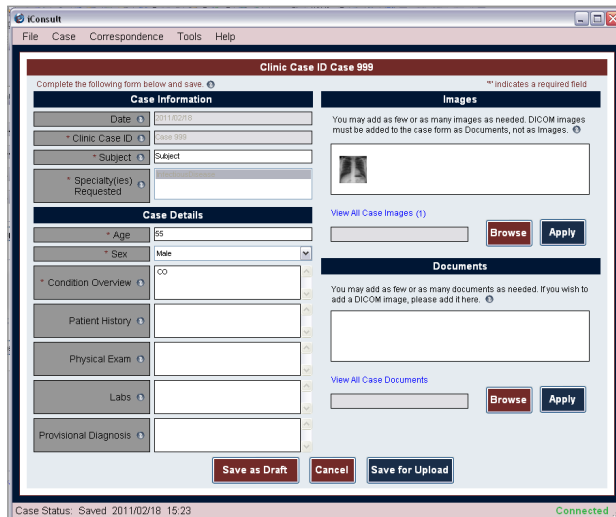
Appendix A

Sample screens from iConsult client-server application

Login Screen

Case Screen

Image Annotation Screen

Messages Screen

Appendix B

Allergy and Immunology
Anesthesiology
Colon and Rectal Surgery
Dermatology
Emergency Medicine
Family Medicine
Internal Medicine :: General
Internal Medicine :: Adolescent medicine
Internal Medicine :: Cardiology
Internal Medicine :: Endocrinology
Internal Medicine :: Gastroenterology
Internal Medicine :: Geriatrics
Internal Medicine :: Hematology
Internal Medicine :: Infectious disease
Internal Medicine :: Nephrology
Internal Medicine :: Oncology
Internal Medicine :: Pulmonology
Internal Medicine :: Rheumatology

Medical Genetics
Neurological Surgery
Nuclear Medicine
Obstetrics and Gynecology
Opthamology
Orthopaedic Surgery
Otolaryngology
Pathology
Pediatrics
Physical Medicine and Rehabilitation
Plastic Surgery
Preventative Medicine
Psychiatry and Neurology
Radiology
Surgery
Thoracic Surgery
Urology

Appendix C

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iCons
in Medicine
"iConsult"

A Global Telehealth and Humanitarian Medicine Volunteer Alliance
www.iconsinmed.org

iConsult is a program of iCons in Medicine that uses the Internet to connect healthcare providers in remote or medically underserved areas (Requestors) with a network of committed specialty physicians (Volunteers) who volunteer their expertise to provide clinical support. This program expands treatment options for patients who otherwise would not have access to specialty care.

PROVIDING TELECONSULTATIONS – VOLUNTEERS

Volunteers are physicians who provide free teleconsultations and clinical decision-making support to healthcare providers in remote or medically underserved areas. The responsibilities of the Volunteer are as follows:

- Provide a minimum of three medical teleconsultations per year to healthcare providers in remote or underserved areas using the iConsult features of the iCons in Medicine website.

- Communicate peer-to-peer as a source of knowledge for the requesting healthcare provider (no doctor-patient relationship is established).

- Maintain a valid license to practice medicine in a recognized iConsult healthcare specialty.

Allergy and Immunology	Internal Medicine: Hematology	Otolaryngology
Anesthesiology	Internal Medicine: Infectious Disease	Pathology
Colon and Rectal Surgery	Internal Medicine: Nephrology	Pediatrics
Dermatology	Internal Medicine: Oncology	Physical Medicine and Rehabilitation
Emergency Medicine	Internal Medicine: Pulmonology	Plastic Surgery
Family Medicine	Internal Medicine: Rheumatology	Preventative Medicine
Internal Medicine: General	Medical Genetics	Psychiatry and Neurology
Internal Medicine: Adolescent Medicine	Neurological Surgery	Radiology
Internal Medicine: Cardiology	Nuclear Medicine	Surgery
Internal Medicine: Endocrinology	Obstetrics and Gynecology	Thoracic Surgery
Internal Medicine: Gastroenterology	Ophthalmology	Urology
Internal Medicine: Geriatrics	Orthopaedic Surgery	

GROUPS OF VOLUNTEERS - CHAPTERS

Chapters are responsible for recruiting and enrolling qualified physicians as Volunteers in the iConsult program.

All Volunteers enroll in the program through a Chapter. iConsult Volunteers may choose to join an existing Chapter or begin one of their own. Volunteers generally enroll in a Chapter with which they have a prior affiliation, such as a Chapter based at their place of employment. New Chapters are formed when three or more Volunteers (Chair, Medical Director, and Secretary) apply to create a Chapter.

(See reverse side for technical requirements, tools and features)

To learn more about iConsult or to join, visit
www.iconsinmed.org

TECHNICAL REQUIREMENTS FOR VOLUNTEERING

In order to participate in iConsult, Volunteers should have the following:

- PC with 32 bit Microsoft Windows and 5 megabytes of free hard drive space
- Internet connection with Microsoft Internet Explorer version 5, 6, or 7

TOOLS AND FEATURES FOR VOLUNTEERS

Once enrolled in a Chapter, Volunteers use the iCons in Medicine website to provide consultations. Features include:

- E-mail notification of new cases
- Personal homepage from which Volunteers can manage and respond to cases, read current news, and view their contacts
- Searchable member directory that allows Volunteers to find additional information about requesting healthcare professionals and other Volunteers
- "My Information" pages for managing personal profiles and preferences
- Forums, listservs, messaging, and chat rooms to allow participating members to network and exchange information
- User manuals and instructions for technical support

To learn more about iCons in Medicine or to join
visit www.iconsinmed.org

Appendix D

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iCons in Medicine
"iConsult"

A Global Telehealth and Humanitarian Medicine Volunteer Alliance

www.iconsinmed.org

iConsult is a program of iCons in Medicine that uses the Internet to connect healthcare providers in remote or medically underserved areas (Requestors) with a network of committed specialty physicians (Volunteers) who provide clinical support. This program expands treatment options for patients who otherwise would not have access to specialty care.

REQUESTING TELECONSULTATIONS - REQUESTORS

Requestors are healthcare professionals managing challenging cases in remote or medically underserved areas. Requestors gain access to clinical advice from iConsult Volunteers. Healthcare providers working in non-profit clinics, hospitals, or NGOs in remote or medically underserved areas who are licensed to practice medicine in the jurisdiction in which they work are eligible to request teleconsultations through iConsult.

HOW IT WORKS

The medical collaboration is made possible by pairing specially designed computer software with a social networking website. The service is free and allows healthcare providers to access a network of specialty physicians from around the world.

Requestors use the iConsult desktop computer software to complete a consultation form which includes a patient history, all relevant clinical details of the case, and the specialty area in which advice is sought. The software saves the information until an Internet connection is available. Once connectivity is established, the iConsult computer program routes the case to all Volunteers in the specialty area selected by the Requestor. Once a Volunteer accepts the case, the Requestor and Volunteer are able to engage in a one-to-one dialogue on the particulars of the case.

GROUPS OF REQUESTORS - MEMBER ORGANIZATIONS

Member Organizations are responsible for recruiting and enrolling qualified healthcare providers as Requestors in the iConsult program. Non-profit organizations such as clinics, NGOs, and ministries of health that deliver health services in remote or medically underserved areas and that operate in a manner that is consistent with the iCons in Medicine mission are eligible to form iConsult Member Organizations.

All Requestors enroll in the iConsult program through a Member Organization. Requestors may choose to join an existing Member Organization or begin one of their own. In general, Requestors enroll in a Member Organization with which they have a prior affiliation, such as a Member Organization based at their place of employment.

(See reverse side for technical requirements, tools, and features)

To learn more about iConsult or to join,
visit www.iconsinmed.org

TECHNICAL REQUIREMENTS FOR REQUESTING

In order to participate in iConsult, Requestors should have the following:

- PC with 32 bit Microsoft Windows and 5 megabytes of free hard drive space
- Internet connection with Microsoft Internet Explorer version 5, 6, or 7

TOOLS AND FEATURES FOR REQUESTORS

Features of the iConsult computer program include:

- Small file size to enable rapid download
- Easy to install and use
- Compatible with limited or unreliable internet connectivity
- Secure login
- Built-in consultation form
- Imaging feature allows Requestors to upload digital images, such as X-rays, and add notes to the images for the Volunteer to view
- Ability to attach and send documents
- Encryption and secure socket layer (SSL) connections to enable continuous, secure two-way communication

Requestors also have access to the iCons in Medicine website, which includes:

- Searchable member directories that allow Requestors to find additional information about iConsult Volunteers or other Requestors
- "My Information" pages for managing profiles and preferences
- Forums, listservs, messaging, and chat rooms allow participating members to network and exchange information
- User manuals and instructions for technical support

To learn more about iConsult or to join,
visit www.iconsinmed.org

Appendix E

iConsult is a program of iCons in Medicine that uses the Internet to connect healthcare providers in remote or medically underserved areas (Requestors) with a network of committed specialty physicians (Volunteers) who volunteer their expertise to provide clinical support. This program expands treatment options for patients who otherwise would not have access to specialty care.

NATIONAL SECRETARIATS

National Secretariats provide oversight to Chapters and Member Organizations within a specific geographic area, usually a country. A National Secretariat may be formed either within an existing entity, such as an academic medical center or major hospital, or as an independent charitable entity established solely for iConsult.

The primary responsibilities of a National Secretariat are to:

- Identify, enroll, and oversee "Member Organizations"- groups of healthcare providers working for non-profit institutions in medically underserved areas who wish to receive teleconsultation services through iConsult
- Identify, enroll, and oversee "Chapters"- groups of medical specialists who volunteer as consultants through the iConsult program
- Serve as a link to international iConsult organizations
- Coordinate iCons in Medicine national activities and participate in regional and international meetings

National Secretariats are recruited through a Request for Applications (RFA) process. They are licensed by iCons in Medicine International and may raise money and receive grants for their work.

To learn more about iConsult or to join,
visit www.iconsinmed.org

http://archive.constantcontact.com/fs033/1102482325007/archive/110251853612.html

Features include: Members in the News, Program Updates, Membership numbers and directory, Global Health News, Health IT News, Upcoming Medical Meetings, iCon Links, and more.

●**Issues: 53**   ●**Update: Bi-Monthly**   ●**Readership: 700+**

A blog (weblog) is a website, usually maintained by an individual, with regular entries of commentary, descriptions of events, or other material such as graphics or video. Information on a given Global Health/Health IT topic is posted on four popular blogging websites every two weeks.

● **Update: Bi-Monthly**
● **Average Hits (WordPress):** 15,707 views (total life of blog).
Between February 2010 and February 2011 - 989 views per month

WORDPRESS

http://iconsinmedicine.wordpress.com/

Blogger

http://iconsinmedicine.blogspot.com/

tumblr.

http://iconsinmedicine.tumblr.com/

Facebook is a social networking website where users create a personal profile account and can add friends, send messages, and update statuses. *Facebook groups* are analogous to clubs in the offline world. *Facebook pages* function like a profile account, but is specific to a brand, an organization, etc.

Facebook profile account under William K. Smith

http://www.facebook.com/#!/
iConsinMedicine?v=wall

Facebook iCon Group

http://www.facebook.com/#!/group.php?
gid=55315437969

Facebook iCon Fan Page

http://www.facebook.com/#!/pages/
iCons-in-Medicine/54929163537

Appendix I

http://twitter.com/iCons_in_Med

Twitter is a social networking and microblogging service that enables its users to send and read messages known as "tweets". Tweets are text-based posts of up to 140 characters displayed on the author's profile page and delivered to the author's subscribers who are known as "followers".

●**Update: At least once daily**   ●**Followers: 2,263**

Appendix J

YouTube and Vodpod are video-sharing websites on which users can upload and share videos. CIR, iCons in Medicine and IDRM all have accounts. Below are images of the iCons in Medicine accounts.

Views February 2010-February 2011:
●**CIR: 17,515** ●**iCons in Medicine: 1,279** ●**IDRM: 1,118**

http://www.youtube.com/user/IconsinMedicine

http://vodpod.com/iconsinmedicine/iconsinmedicine

Appendix K

http://www.flickr.com/photos/iconsinmedicine/

Flickr is an image and video hosting website, web services suite, and online community platform
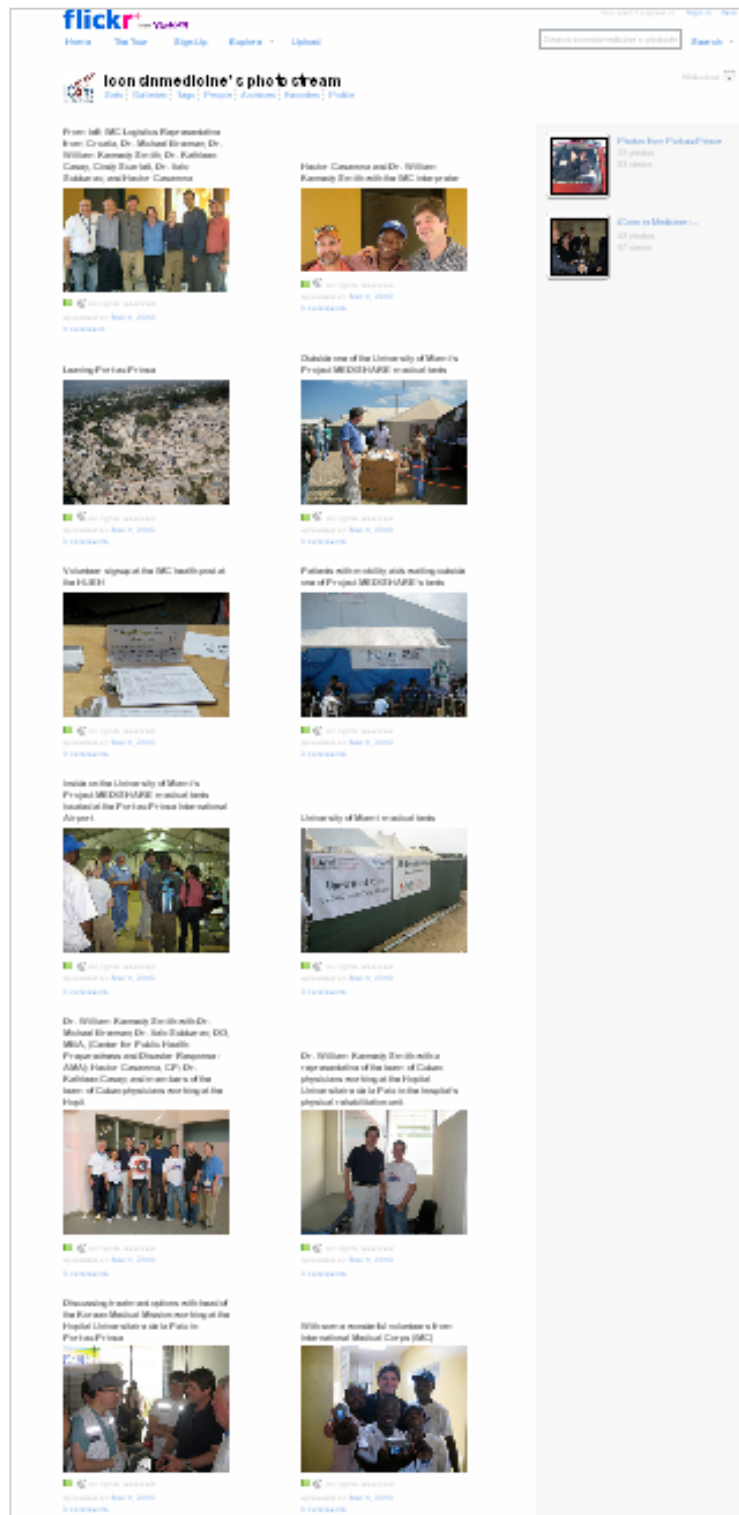
Appendix L

A blog (weblog) is a website, usually maintained by an individual, with regular entries of commentary, descriptions of events, or other material such as graphics or video. Information on a given Global Health/Health IT topic is posted on four popular blogging websites every two weeks.

- **Update: Bi-Monthly**
- **Total Views (WordPress):** 452 views (total lifetime of blog)
   34 views per month (average)

http://theidrm.wordpress.com/

http://theidrm.blogspot.com/

Appendix M

Facebook is a social networking website where users create a personal profile account and can add friends, send messages, and update statuses. *Facebook groups* are analogous to clubs in the offline world. *Facebook pages* function like a profile account, but is specific to a brand, an organization, etc.

| Facebook profile account under William K. Smith (Same as iCon)	Facebook IDRM Group	Facebook IDRM Fan Page
http://www.facebook.com/#!/iConsinMedicine?v=wall	http://www.facebook.com/group.php?gid=54526648977&ref=ts	http://www.facebook.com/pages/The-International-Disability-Rights-Monitor-IDRM/68059862880

http://twitter.com/the_IDRM

Twitter is a social networking and microblogging service that enables its users to send and read messages known as "tweets". Tweets are text-based posts of up to 140 characters displayed on the author's profile page and delivered to the author's subscribers who are known as "followers".

- **Update:** At least once daily
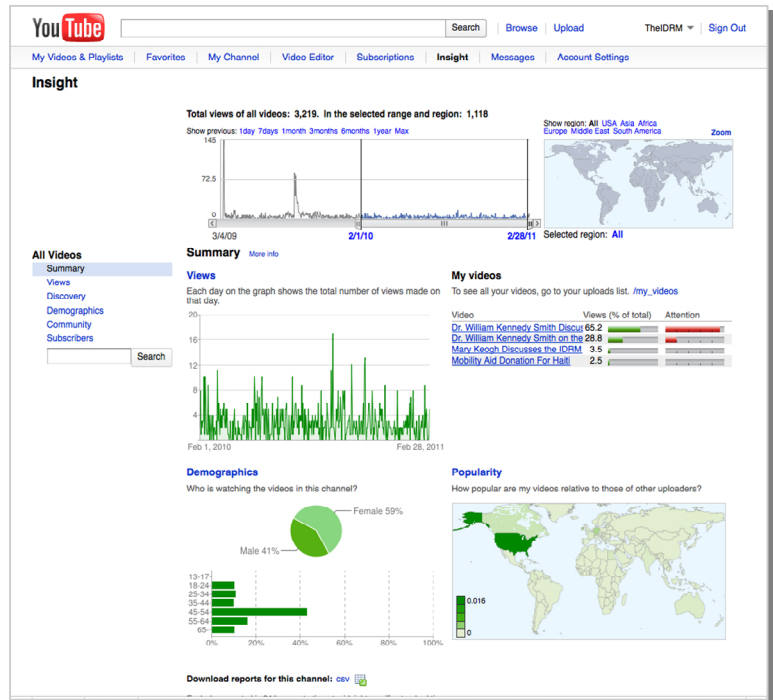 - **Followers:** 212

Appendix O

<p style="text-align:center;color:green;">**http://www.youtube.com/user/TheIDRM**</p>
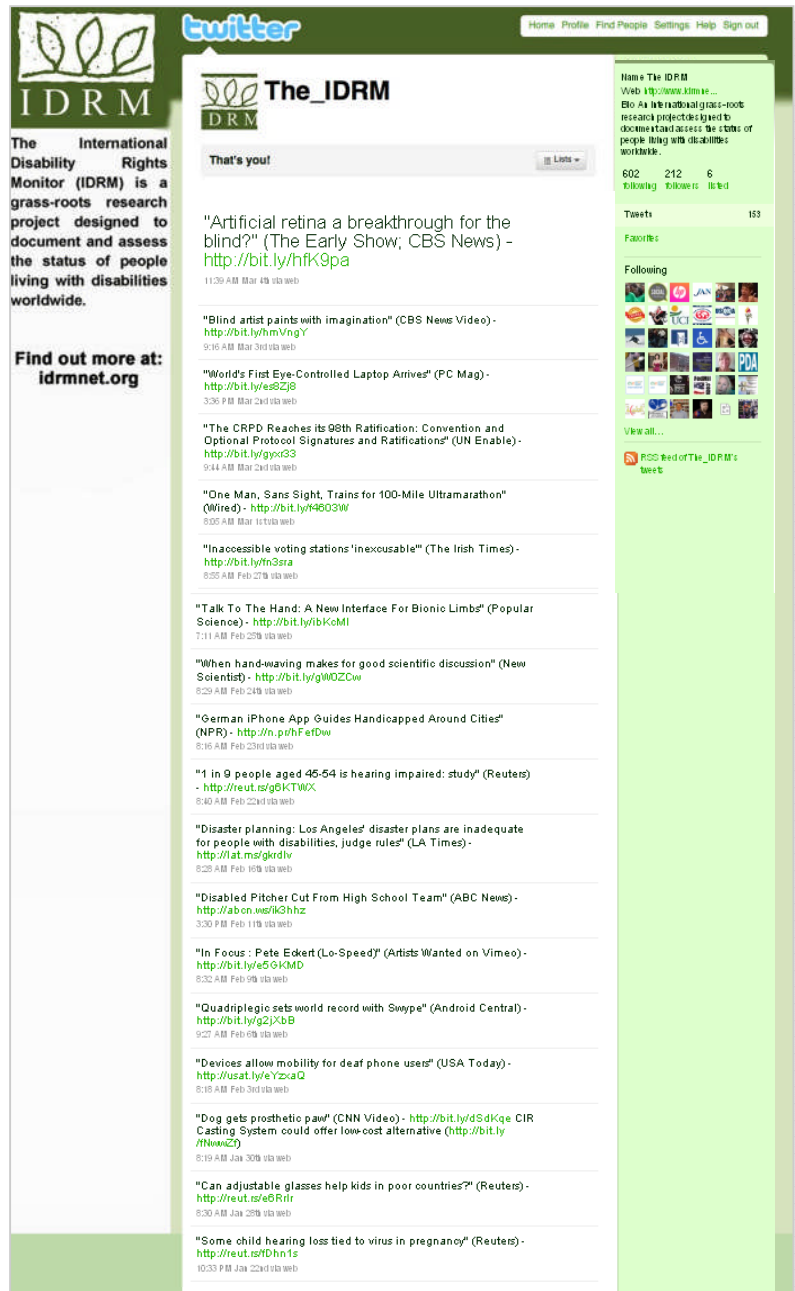
YouTube is video-sharing websites on which users can upload and share videos.

<p style="text-align:center;color:green;">**Views February 2010—February 2011: 1,118**</p>

Appendix P

PERSONNEL AND FINANCIAL REPORTS
(Project Staff, Role, and Percent Effort on Project)

Personnel	Role on Project	Effort on Project
Smith, William K. Dr.	Principal Investigator	21%
Casanova, Hector R.	Vice President of Operations	4%
Coe, Hayward C	Comptroller/Grants Manager	18%
Ervin, Deborah Lynn	Dir of Marketing and Communications	100%
Jackson, Kathryn	Communications Officer	100%
Dave, Krishna	Office Manager	25%
Demetrios Sapounas	Chief Technology Officer	100%

Cost Elements	Current Period	Year-To-Date
PERSONNEL	295,530.56	1,831,269.75
FRINGE BENEFITS	86,285.69	446,531.80
CONSULTANT COSTS (Content EXPERTS, SOFTWARE & WEB DEVELOPMENT)	86,567.00	530,694.13
MAJOR EQUIPMENT	-	-
MATERIALS, SUPPLIES & CONSUMABLES	14,666.12	99,878.26
TRAVEL COSTS	7,458.46	159,539.89
RESEARCH RELATED PATIENT COSTS	-	-
OTHER EXPENSES	51,640.51	263,890.04
SUBTOTAL DIRECT EXPENDITURES	542,148.34	3,331,803.87
TOTAL INDIRECT COSTS FOR THIS BUDGET PERIOD	200,477.97	1,125,843.53
TOTAL INDIRECT COSTS FOR THIS BUDGET	742,626.31	4,457,647.40